1.4 PSP Co	ver Sheet (Attach to the fro	nt of ea	ch prop	oosal)
				itat Enhancement: River Mile 42
	binson Ranch Site)			
	California Department of Fig	sh and (Game pa	artnering with California
Department of W	ater Resources		•	
	Richard Dixon, Senior Fisheri	es Biol	ogist	
Mailing Address	Central Valley Bay-Delta F	Branch.	1416 N	inth Street, Sacramento, CA 95814
Telephone: (91)			=	
Fax: (916) 653-	8256			Z,
Email: <u>rdixon@</u>				
eman. <u>Turkong</u>	<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>		-	1 por
Amount of fund	ling requested: \$ <u>1,699,101</u>			
Some entities ch	arge different costs dependent	on the	source o	of the funds. If it is different for
state or federal f	unds list below	• • • • • • • • • • • • • • • • • • • •		
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Cost share part	mers?	7	X_Yes	No
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identity partitions	, and allowing commission by co			
CALFED	secured	\$	2,443,0	000 (contract in-place w/CDWR)
	mps Preliminary Engineering		40,0	000 (secured and spent)
	mps Project Obligation		2,693,8	300 (secured/available)
DFG Pro	pposition 70 funding		250,0	000 (currently spending)
AFRP (F			500,0	00 (contingent FFY01)
	nal Four Pumps Obligation		500,0	000 (proposed)
	nal CALFED Obligation		699,1	101 (proposed)
	nal AFRP (FFY02)		500,0	000 (proposed)
	racy Funding (FFY01)	_	250,0	000 (proposed)
	ed Total Project Cost	5	7,875,9	901
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Indicate the To	opic for which you are apply	ing (ch	eck only	y one box).
□ Nonnative II			-	X2 Relationships
□ Natural Flow				Decline in Productivity
	namics/Sediment Transport	l	a [Diversion Effects of Pumps
□ Flood Mana	•			Importance of the Delta for Salmon
□ Bypasses a				Beyond the Riparian Corridor
	ater Tidal/ Marsh Habitat			Watershed Stewardship
				Environmental Education
□ Contaminar	11.5			Citylionida. Leadann
What county of	r counties is the project located	d in? <u>N</u>	Merced (County
What CALFE	D ecozone is the project loca	ited in?	See att	tached list and indicate number.
	as possible East San Joaquin			
x	-			
Indicate the tvi	pe of applicant (check only on	e box):		
X State ager		•		Federal agency
	-			

]	Public/Non-profit joint venture		Non-pront
<u> </u>	Local government/district		Tribes
□	University	₽	Private party
	Other:		
Ind	icate the primary species which the proposal a	addresses	(check all that apply):
X	San Joaquin and East-side Delta tributaries f		hinook salmon
	Winter-run chinook salmon		Spring-run chinook salmon
□	Late-fall run chinook salmon	\mathbf{X}	Fall-run chinook salmon
	Delta smelt		Longfin smelt
	Splittail		Steelhead trout
	Green sturgeon		Striped bass
	Migratory birds		All chinook species
	Other:	□	All anadromous salmonids
			•
Inc	dicate the type of project (check only one bo	ox):	
	Research		Monitoring
	Pilot/Demo Project		Watershed Planning
\mathbf{X}	Full-scale Implementation		Education
	this a next-phase of an ongoing project?		X No
Ηa	eve you received funding from CALFED before	re? Yes	_X_ No
		•	
If	yes, list project title and CALFED number:		C. H. During Batalaff
,	"Phase I-Merced River Salmon Habitat Enhancement:	: River Mil	e 40 to 40.5 (Robinoson/Gallo Project-Kaiziaj)
	Reach Site)" CALFED Directed Action #99-B05; "Phase 3-Merced River Salmon Habitat Enhancement.	· River Mil	e 42 to 43.5 (Robinoson/Gallo Project-Robinson
	Ranch and Gravel Mining Permit #307 Sites)" CA	LFED/US	FWS Doc. Control #11420-9-J045
H	ave you received CVPIA before? Yes X	No	<u> </u>
=	"Phase 1-Merced River Salmon Habitat Enhancement	t: River Mil	le 40 to 40.5 (Robinoson/Gallo Project-Ratzlaff
	Reach Site)" AFRP/USFWS Agreement Doc. Cor	ntrol #1133	12-9J023;
	"Phase 3-Merced River Salmon Habitat Enhancement AFRP-USFWS Agreement Doc. Control #11332-9-J0	r: River ivili 124	le 40 to 40.5 Lower Western Blone Reach and
	AFRI-OSI WS Agreement Door Control #11552 > 50		
R	y signing below, the applicant declares the fol	llowing:	
ט	• The truthfulness of all representations i		roposal:
	The individual signing the form is entity		
	applicant (if the applicant is an entity of		
	The person submitting the application 1		
	and confidentiality discussion in the P	SP (Secti	on 2.4) and waives any and all rights to
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	provided in the section.		
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	PICHARD L. DIXON		
_ T	Printed name of applicant		
r	THIER MAINS OF APPLICANT		

Signature of applicant

B. EXECUTIVE SUMMARY

Project Title: Revised Phase 2: Merced River Salmon Habitat Enhancement River Miles 42 to 44

(Robinson Ranch and Permit #307 sites).

Amount Requested: \$699,101 CALFED (requested funding increase)

\$1,000,000 AFRP (\$500,000 obligation increase)

Applicant: California Department of Fish and Game/Central Valley Bay-Delta Branch

4001 North Wilson Way; Stockton, CA 95205-2486

Attention: Mr. Richard Dixon

California Department of Water Resources/Four Pumps Program

3251 "S"street; Sacramento, CA 95816-7017

Attention: Ms. Stephani Spaar

<u>Participants/Collaborators</u>: Anadromous Fish Restoration Program (USFWS); Delta Pumps Fish Protection Program (Four Pumps); Tracy Fish Facility Mitigation Program (USBR); CalTrans; Merced River Stakeholders; Robinson Ranch, Inc.

Project Description: The proposed project revision has been created by beneficial changes to the size and scope of project design for the second project phase of the Merced River Salmon Habitat Enhancement Project to restore a degraded four mile section on the Merced River (river miles 4.0 to 44). In 1998 the second project phase for the very upstream portion of the planned enhancement area was approved to receive funding from the CALFED Program. During the Phase 2 Project planning efforts participants and collaborators gained knowledge from Phase 1 construction of the 1999 Ratzlaff Project, realized public support, gained restoration design opportunities from CalTrans participation, and incorporated stakeholder and peer input. As a result, the original project identified in 1998 has changed and the proposed Revised Phase 2 project results in a significant increase in project size, scope, and benefits as well as increases in associated costs for additional material and construction. The new proposed Phase 2 project is planned on Merced River miles 42 to 44.

The approach taken for the Phase 2 project, referred to as the Robinson Site Project, will include a very complex suite of restoration actions to restore a reach of the Merced River that is degraded as a result or mining activities and aggregation downstream of dams, tailings and pits within the river. The improved channel dynamic/sediment transport will include: channel reconfiguration, creation of large floodplain with native vegetation, and berm reconstruction. Over the entire reach these actions within the channel should produce improvements for salmon spawning and rearing through created spawning riffles, runs, and pools, and water quality improvements.

The hypotheses being tested will attempt to determine how well restoring geomorphic processes so as to optimize ecosystem benefits will improve factors influencing salmonid populations in the Merced River. Project activity includes: gravel augmentation and bed mobility thresholds; channel and floodplain reconstruction; increase river dynamics, and gain information of any geomorphic uncertainties in project design.

The expected outcome of the project is the protection and enhancement of one of the more important natural salmonid spawning reaches on the Merced River through a collaborative partnership process. The proposed second phase increases the size and scope of the original project and should further achieve the ERP's strategic goals of restoring ecological health, achieve recovery for an at-risk native species, and protect and restore functional watershed habitat types.

C. PROJECT DESCRIPTION

1. STATEMENT OF THE PROBLEM

a. Problem:

This proposal provides additional funds which are necessary to construct a previously approved project (Attachment 1). Cost increases are necessary to achieve the objectives identified in the 1998 proposal and have been caused by increased material and construction costs as well as a substantial increase in both the size and scope of the original project. The original project, River Miles 42 to 43.5, is contained within the new project footprint which is River Miles 42 to 44. Project planning activity is on schedule and construction is planned between the months of April and October during 2001 and 2002. (Figure 1)

The primary objectives of the revised project include improving upstream adult salmon passage, improving downstream juvenile salmon survival, removing salmonid predator habitat, improving spawning and rearing habitat for juvenile salmon at a badly altered and ecologically dysfunctional section of the Merced River. This situation worsened following the 1997 high flow event. Adult salmon passage will be improved by creating a functional stream channel which will eliminate the shallow, stream sheet flow situation which now exist during the spawning migration period. During past salmon spawning migrations, CDFG was forced to dig an emergency channel through the area so that adult salmon could move upstream. Juvenile salmon survival will be improved by reducing predator contact; by first, the reconstructed channel will quickly pass smolts through the project in a true stream channel, thus increasing the odds for predator avoidance; and second, the filling and isolation of existing ponds will remove warmwater habitat which supports large numbers of predator species. In order to improve spawning and rearing habitat for salmon, the channel will be reconfigured and spawning size gravel will be added.

The revised project will include scaling the channel to fit the post-dam flow regime. Over the entire reach, the channel will be designed to include spawning riffles, runs, and pools, with a meander which fits the approximate slope and bankfull flow of 1,700 cfs. It will also include floodplains which will be replanted with native riparian vegetation.

This project will implement the second project phase of the Merced River Salmon Habitat Enhancement Project: River Miles 40 to 43.5 (Merced Salmon Project) which includes five independent construction elements. Once the Merced Salmon Project is completed in total, it will protect one of the more important natural chinook salmon spawning reaches on the Merced River. Preliminary design and planning for the entire 3.5 mile project area was completed in 1996 by DWR with guidance from DFG Region 4 staff. The Phase 1 project involved completing construction of the most downstream element of the project (Ratzlaff Site) during the summer of 1999. Phase 2, the proposed Robinson Site project, is at the very upstream portion of the Merced Salmon Project, includes a very complex suite of restoration actions, and incorporates two very important elements of the Merced Salmon Project. It is not only the largest planned restoration site (2 miles), but it includes significant channel reconfiguration, creation of a large floodplain, massive material manipulation, berm reconstruction, and hydrodynamic coordination with CalTrans bridge reconstruction. A key planning element of this proposed project has been the positive transition of a once adviserial landowner relationship to a current positive working partnership with the immediate landowner. The project design specifications are presented in Table 1 and further explained in Attachment 2.

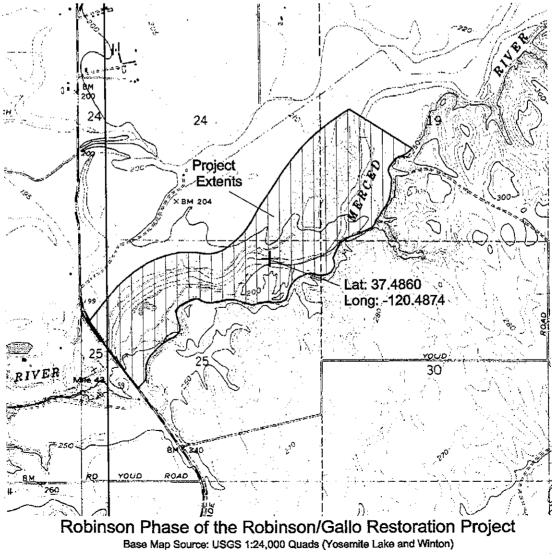


Table 1. Project design specifications (preliminary) for Merced River Salmon Habitat Enhancement: Robinson Site, River miles 42 to 44.

Project Parameters:

Valley Length: 1.8 miles

Area: 264 acres

Pond Area Removed: 45 acres Pond Area Isolated: 10 acres

High Terrace Area Created: 28 acres Length of berm created: 2,900 ft

Channel Parameters:

Length: 10,400 ft (or about 2 miles)

Low Flow: 225 cfs

Low Flow Depths: 2 ft (riffles) to 4 ft (pools)

Average Low Flow Width: 50 ft

Bankfull Flow: 1,700 cfs

Bankfull Depths: 5 ft (riffles) to 7 ft (pools)

Average Bankfull Width: 120 ft

Bankfull Average Velocity: 4.5 ft/s (riffles) to 3.2 ft/s (pools)

Flood Flow (minimum): 8,000 cfs

Flood Flow Depths: maximum of 10.2 ft (riffles) to 12.1 ft (pools) Flood Flow Average Velocities: 4.7 ft/s (riffles) to 4.3 ft/s (pools)

Flood Plain Width: 400 (bridge) to 1,100 ft Meander Wavelength: 1,100 to 1,700 ft

Total area suitable for spawning to be constructed: 21,900 yd2

Material Total Volumes:

Total volume of material to be manipulated on-site will be approximately 1 million tons.

This proposal requests additional funds from both CALFED and AFRP which are necessary to construct the project approved for CALFED funding in 1998. This project was also identified favorably in the 2000-01AFRP funding process. Reasons for the budget increase include increased material costs as well as a significant increase in the scope of the project. Some of the events and factors which led to the increased budget are as follows:

- 1998 budget based on cost estimates for a similar Stanislaus River project (Willms Project) which was stopped when the landowner removed his approval of the project late in the planning process.
- Include project investment protection. Cost and means to adequately protect and maintain project benefits "in perpetuity" were only speculative in 1998;
- Revised cost budget is based on recent experience gained from constructing the segment of the Merced River Salmon Restoration Project: Ratzlaff Site, constructed during the summer of 1999 at the lower end of the 3.5 mile project site;
- Relationships and opportunities created by adjoining land-use activities required the scope of the project to increase beyond 1998 estimates (ie. landowner, CalTrans bridge retrofit, peer review, and stakeholder concerns);
- Cost increases reflect realistic price changes (considering a positive economy and the UC Merced construction competition) in materials, construction equipment and management, long-term project maintenance, and project monitoring;
- Budget increase reflects project success costs associated with securing landowner cooperation, securing stakeholder support, resolving peer concerns, providing sufficient long-term maintenance funding, and instituting scientifically sound project monitoring programs;
- Without additional funds, the scope of the project would have to be reduced. A reduced project would not adequately resolve the juvenile fish passage problem;
- Because existing landowner plans include mining several potential gravel sites in the area, land-use activities which would jeopardize project investment;
- Delaying portions of the project would jeopardize the very cooperative landowner and agency partnering relationships which currently exist and are yielding expanded environmental benefits.

Modifications to the scope and size of the project are as follows:

► Increased project size (29% plus increase):

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>Project Area = +18.0 acres (28% increase)
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>Riparian/floodplain = +14.5 acres (80% size increase)

>Project length = +2,700 feet (29% increase => \sim 2 miles or River mile 42 to 44)

>Spawning Area = +3,500 sq. yds. (16% increase)

- ► Increased project scope includes:
 - >Long-term property use easement.
 - >Use of onsite gravel resources for current and future projects. This could result in reduced material costs for future projects and long-term maintenance.
 - >Acquire mining rights or control/influence of future operations within a significant portion of the area, thus providing environmental protection in perpetuity.
 - >Larger project site translates into a geomorphically more stable project.
 - >Partnering with CalTrans has expanded the construction footprint of the project to extend downstream and include below the bridge, and yielded a more environmentally sound bridge design (200 ft. longer, 20 ft. higher, more river friendly stream passage).
 - >Landowner maintenance and management easement/agreement.

Specific project biological/ecological objectives are:

♦ Improve adult and juvenile salmon passage by reconfiguring stream channel conditions;

- ♦ Eliminate juvenile salmon predator habitat by filling the unnatural instream pond area;
- ♦ Increase the quantity and quality of spawning habitat for chinook salmon by adding spawning gravel, reconfiguring spawning beds and the river course, and lowering radiant heat influx to the stream by reducing slow moving pond water surface area;
- ♦ Increase the quantity and quality of rearing habitat for chinook salmon by increasing available inchannel diversity;
- ♦ Improve river and floodplain dynamics by reconfiguring the channel to better conform with the present flow regime;
- ♦ Enhance riparian and seasonally inundated vegetation by increasing and revegetating floodplain at the project site which will be inundated by the river during high flows.

b. Conceptual Model:

The Merced River has undergone extensive modification over the years to provide agricultural and municipal water supply, flood control, and power generation, as well as raw materials such as gravel products and gold. As early as the 1870's, large canal systems were built to divert Merced River water for agricultural uses. Several dams were built to regulate flows, the largest being New Exchequer Dam (completed in 1967) which can store up to 1,032,000 acre-feet of water in its reservoir. Mining for gold and aggregate downstream of the dams has been extensive, leaving tailings and numerous pits within the river corridor.

The manipulation of the river has led to loss and degradation of native habitat. With the building of dams, access to spawning grounds upstream has been lost, and gravel recruitment is greatly reduced in reaches below the dams. The large in-stream ponds left by mining have created marginal salmon habitat which is favorable for introduced warmwater fish species which prey upon juvenile salmon. In an effort to better understand those problems influencing salmon production in the Merced River, CDFG biologists have identified several factors which, in concert, seem to have contributed to the decline of San Joaquin fall-run chinook salmon. Among those identified factors are degraded channel, poor gravel composition, low flows, high water temperatures, low intragravel oxygen content, predation on outmigrating juvenile salmon by warmwater fish such as large and smallmouth bass, and insufficient suitable spawning habitat (CDFG, November 1993; CDFG Memo September 6, 1991, CDFG Memo November 23, 1987). Specific to the proposed project site, CDFG biologists estimate that 25 percent of the annual Merced River natural salmon spawning and production occurs upstream from the "Robinson" site (B. Loudermilk, personal communication). This logically implies that a significant portion of the Merced River annual production of natural outmigrating salmon juveniles must successfully negotiate this man-made hazard.

Flow regulation leads to reduced peak flows and an overall reduction in the average flow in the river. These result in a general narrowing of the channel (J. Vick, 1995). The two-year flow event before dam construction (pre-Exchequer) was approximately 16,000 cfs (Exchequer gage). Flow records show that since New Exchequer Dam began operation, the two year event is approximately 2,300 cfs (Snelling gage). This means that the high flows which traditionally scoured and flushed vegetation from active gravel bars and banks and delivered coarse sediment are all but absent. As a result there is encroachment of vegetation which leads to narrowing and armoring of the channel.

A loss of gravel recruitment to the lower reaches of the river can also be attributed to dams. The river is "sediment starved" during higher flows, and tends to recruit sediment from channel banks and beds. In the absence of sufficient gravel recruitment, over time the channel scours and degrades, which when combined with reduced flow can further narrow the channel and lead to the loss of active floodplains.

Prior to the January, 1997 flood event, the reach of Merced River between the Highway 59 bridge and Snelling (within which this project falls) had shown little evidence of degradation, although reaches both upstream and downstream of it appeared to be degrading (J. Vick, 1995). During the 1997 event the berms which had confined the river to the historic channel in the project reach (RM 42 to 43.5) were breached, and as a result the river abandoned its channel in favor of a gravel pit with an invert approximately six feet lower. This abandonment of the channel resulted in the loss of several prime salmon spawning riffles, a good deal of existing nursery habitat, created favorable habitat for salmon predators which favored warmwater, created a seasonal passage problem for adult salmon spawners, hindered outmigrating juvenile salmon passage, and reduced smolt survival.

Prior to the 1997 flood event, the project reach consisted of a narrow channel confined by levees with in-stream ponds and no floodplain. With the 1997 flood event came several major changes to the geomorphic characteristics of the reach. When the river breached the levees which had confined it, for much of the length, the river now travels through a wide, flat area which lacks a defined channel or adequate gravel, and then into a series of ponds. Not only is this situation geomorphologically dysfunctional, it provides many barriers to both juvenile and adult salmon survival. The wide, flat, shallow area presents stranding issues during flow fluctuation, as well as avian predation of smolts. During low summer/fall flows, the wide, flat, shallow area provides a passage problem for adults returning to upstream spawning areas (during the September of 1997, CDFG was for forced to dig a temporary channel through part of the proposed project site to facilitate a safer fish passage past the site). The in-stream ponds provide habitat for predatory fish. The ponds also serve to increase water temperatures, particularly under low flow conditions.

The river now flows through these warm ponds of slow-moving water which are ideal habitat for large and smallmouth bass and other predators of juvenile salmon. An earlier pilot study which investigated predation of juvenile salmon in ponded portions of the Tuolumne River indicated that small and largemouth bass were a legitimate predator of juvenile chinook salmon (EA, September 1990). More recently, conclusions drawn from a radio tagged salmon smolt recovery study conducted in 1998 on the Stanislaus River (D. Demko, personal communications) support the earlier Tuolumne River studies which document substantial salmon smolt predation by bass species. Anecdotal information further indicates the well accepted knowledge that most instream ponded areas within the Stanislaus, Tuolumne, and Merced Rivers provide excellent bass fishing. This information strongly suggests that a significant salmon predator relationship exits in all captured mining pits throughout the east-side San Joaquin basin tributaries. The juvenile salmon migrating downstream become disoriented in the slow moving waters of the pond and become extremely vulnerable to predation by bass and other potential predators. It is reasonable to assume that juvenile salmon transiting through these warm water ponds, sluggish and bewildered by a lack of current and increased thermal gradient, are less likely to survive than those salmon smolts outmigrating in faster moving cool river water. It is also logical to expect that the ponds also serve as a reproduction site, rearing area, and distribution point from which these salmon predators migrate and recharge the entire river system.

The proposed project will scale the channel to fit the post-dam flow regime which favored salmonid species. Over the entire reach, the channel will be reshaped to include spawning riffles, runs, and pools, with a meander which fits the approximate slope and bankfull flow of 1,700 cfs. The floodplains will be replanted with native riparian vegetation. The upstream section of the project will consist of the reconstructed river channel, floodplains, and high terraces, while the downstream reach may use berms to isolate two ponds. Although the project is attempting to eliminate the need for any berms, if necessary, the berms will be constructed to exclude a flow of at least 8,000 cfs (30 year

event), and will include unique state-of-the-art "equalization saddles" and bank protection to minimize damage during high flows.

This project represents the beginning of "Full-scale Implementation" of the Merced River Salmon Habitat Enhancement: River Miles 40 to 44. A small pilot salmon predator isolation project was constructed on the Merced River by DFG/DWR in 1996 at River Mile 30. This habitat enhancement project has since been repaired and modified following the 1997 high flows event. A great deal of knowledge regarding berm construction, floodplain restoration, and channel behavior during higher flows has been gained from this early project. Some of this knowledge has been acquired from observing how the project has integrated with the natural river processes and even more has evolved from a healthy post-project technical review discussions with other agencies, academics, stakeholders, and private consultants. Some of this knowledge was incorporated into the construction of the Ratzlaff Site project during the summer of 1999, which was the first stage of the Merced River Salmon Habitat Enhancement Project and just downstream from the proposed Robinson Site. The Ratzlaff Site project on Merced River (River Miles 40 to 40.5) is considered the "Demonstration Project" for the entire proposed Merced Salmon Habitat Enhancement site. Although the Ratzlaff Site project has only experienced one full winter, initial observations and feedback from several concerned sources indicate that at least the floodplain elements of the project seems to be performing well. Elevated river flows during the winter and spring have inundated and deposited both sediment and vegetation plantings on the created floodplain. The proposed Robinson project design has incorporated the additional knowledge gained from constructing the Ratzlaff Project.

c. Hypotheses being tested:

- ► Hypothesis 1 Following restoration of physical habitat conditions at the project site (temperature, flows, etc.), more salmon smolts will survive through the project site;
- ► Hypothesis 2 Water velocity, depths and temperature conditions will become more favorable for anadromous and resident salmomonids;
- ► Hypothesis 3 Adding clean gravel and appropriate spawning depths to the streambed will increase the amount of spawning habitat for chinook salmon;
- ► Hypothesis 4 Increase spawning success through increased spawning habitat can be associated with habitat restoration;
- ► Hypothesis 5 Restoring seasonally inundated floodplain habitats will allow replanted native riparian and plant species to colonize and naturally reproduce under the reconfigured flow regime.
- ► Hypothesis 6 Restoring floodplain and a source of available gravel will re-establish physical processes which are necessary to self-maintain salmon spawning and rearing habitat.

d. Adaptive Management:

"Adaptive Management" has been defined as 1) a response to uncertainty about the system being managed, and 2) actions are designed to provide new information about the system (J. Williams, 1998). Addressing the problems and concepts presented above, in the section-b "Conceptual Model", the project design (an experiment which will be tested) has been engineered to withstand a 30-year flood event and a project life of 50-years (response to system uncertainty). The project proponents accept the fact that, in time, the river will force changes to the initial project design. One of the project objectives is to restore some function freedom to the river and change is normal in natural river systems. Within social and fiscal capabilities, project designers are attempting to insure that the river will have dynamic access to as much floodplain as possible. This is one reason the project size and cost has been increased. A major element of the project monitoring design is to gain knowledge of the channel change to identify project modification if necessary. To accomplish this, the proposed project planning

has proceeded beyond just interpreting experiment results of the project experiment and included contractual responsibilities for project adjustments suggested by project monitoring results (maintenance activities). One important project component not well understood at this time is the necessary gravel budget required to maintain a positive salmon habitat. Because controlled river systems are usually gravel deficient below the dam structures, the proposed project has been assumed that gravel supplementation will be a necessary maintenance element of the project. One of the initial products required of the geomorphic monitoring program is to establish a gravel maintenance replenishment rate schedule. It should be noted that the gravel captured by the river at the proposed Phase 2 Robinson Site will continue to move downstream and provide gravel benefits throughout the 4-mile Merced River Project area.

Therefore, to insure the proposed project life expectancy, funds have been incorporated within the project budget to provide repair and maintenance for the identified 50-year time frame. Within the identified project cost-share obligations, under the supervising direction of CDFG regional staff, site specific Geomorphic Monitoring, Evaluation, & Adjustments is the budget responsibility of CDWR which will be paid from a funding source reimbursed by water contractor fees. This positive funding arrangement places maintenance activities under the jurisdiction of a responsible and dependable government agency with a reliable funding source. Although the maintenance activities may change depending on findings identified during project monitoring, available funding has been guaranteed to insure continuation of the project.

Budgeted maintenance funding has been estimated based on predicted gravel replenishment rates and established existing levee/berm maintenance costs. The frequency and magnitude of predicted gravel replenishment has been estimated using current project experience which is about 4000 cubic yards being added every three years. This estimated gravel replenishment rate will be revised based on site specific information collected during the early stages of the Project Physical Monitoring. The current landowner materials and access easement negotiations includes discussions which may lead to acquisition of the mineral rights for the entire project site. This would not only provide a ready source of gravel replenishment for the entire Merced River reach, but also a major level of protection in perpetuity for the proposed project. At a minimum, CDFG will negotiate easements which specify environmental friendly land use activities within the immediate project site. Having secured funding in place is key to finalizing any landowner agreements.

2. PROPOSED SCOPE OF WORK

- a. <u>Location</u>: The project site is located in Merced County (Assessor's Parcel No. 042-230-001), on the Merced River, approximately 4 miles downstream from the town of Snelling, between River Miles 42 and 44 (Section 26 & 27; Twp. 5 south; Range 13 east; Base MDB & M). The project site includes approximately 2 miles or the Merced River immediately upstream of the J59 highway bridge (see Figure 1 and page 7 of Attachment 2).
- b. <u>Approach</u>: See Attachment 2, "Merced River, Robinson/Gallo Project Preliminary Design Report for the Robinson Phase, California Dept. of Water Resources, San Joaquin District February 15, 2000".
- c. <u>Monitoring and Assessment Plans</u>: Preliminary monitoring programs for Physical River Process, Fisheries Abundance, and Revegetation efforts were presented in the original 1998 project proposal (Attachment 1). These monitoring programs have undergone considerable discussion since that time

and both the fisheries and geomorphic monitoring programs have been modified substantially. It is intended for the Robinson monitoring programs to compliment the current monitoring activities which are taking place at the recently constructed Ratzlaff Site 2, miles downstream. These Geomorphic and Fisheries monitoring programs are attached (Attachment 3 and 4). It should be noted that the U.S. Fish and Wildlife Service (USFWS) is also seeking AFRP funds to conduct PHABSIM monitoring over the entire 4 mile Merced River Salmon Habitat Enhancement Project site. Although this USFWS project is an important compliment to this proposed project, the prime objectives of this pilot monitoring program differs significantly from the geomorphic monitoring identified in this proposal. The objective of the monitoring presented in this proposal is to assess gravel movement and stream process change at the immediate project site. This information will be used to determine the gravel augmentation and project maintenance. The objective of the USFWS study is evaluate whether the Robinson restoration project increases spawning habitat and rearing habitat as compared to PHABSIM modeling.

The revegetation monitoring program presented in the 1998 proposal is patterned after required U.S. Army Corps of Engineers (USACOE) monitoring guidelines. This existing monitoring plan will be adhered to or exceeded, depending on final USACOE permit conditions.

- d. <u>Data Handling and Storage</u>: Quarterly Reports documenting construction activities; monitoring findings; and maintenance activities are intended to be produced by the participating partner and distributed to all funding agencies and interested stakeholders. (See Attachment 5)
- e. <u>Expected Products/Outcomes</u>: The expected product of the proposed project is to complete a major phase of the planned Merced River Salmon Habitat Enhancement Project River Miles 40 to 43.5. The desired outcome is to produce a biologically and physically functional riverine habitat which will improve survival and passage of chinook salmon in Merced River (See section-d, above).
- f. Work Schedule: The proposed revised project is currently planned to start construction in the Spring of 2001 and continuing construction activities through to the Fall of 2002 at various levels of intensity, depending on permitting restrictions. All elements of the project such as environmental documentation, project monitoring, and stakeholder/peer review has been geared to this schedule. The proposed project work schedule, tasks, and milestones are presented in Attachment 5.
- g. <u>Feasibility</u>: The proposed project was originally planned for construction during the Summer of 2000. Experience and technical improvements gained as a result of the completion of the downstream Ratzlaff Site project during the Spring and Summer of 1999 have been incorporated into the planning and design of the proposed Robinson Site project. To accommodate the new changes, the project construction startup has been shifted to the Spring of 2001. At this time, all elements of the proposed project are currently on schedule to meet the necessary construction deadline. This schedule of project elements/tasks includes CEQA/NEPA environmental documentation; cost-share fiscal contracting; biological and physical monitoring preparation and pre-assessment; stakeholder involvement; and peer review of technical design.

A letter of written permission from the single adjacent landowner has been attached for your review (Attachment 6). As mentioned previously, the working relationship with the property landowner has become extremely cooperative over the last year of planning discussions. It should be noted that the status of the landowner is now being considered a salmon enhancement project "partner" with potential project cost-saving donations rather than just a normal adjacent landowner.

D. APPLICABILITY to CALFED ERP GOALS and IMPLEMENTATION PLAN and CVPIA PRIORITIES

1. ERP GOALS AND CVPIA PRIORITIES

The proposed project's relationship to CALFED ecosystem stressors, the USFWS "Anadromous Fisheries Restoration Plan", and the CDFG "Restoring Central Valley Streams: A Plan for Action" is presented in the original project proposal (Attachment 1, Section 4d). Following is the proposed project relationship to current CALFED and AFRP goals and objectives:

Expected Products and Benefits:

Specific project biological/ecological objectives are:

- ♦ Improve juvenile and adult salmon fish passage by reconfiguring stream channel conditions;
- ♦ Eliminate juvenile salmon predator habitat by filling the unnatural instream pond area;
- ♦ Increase the quantity and quality of spawning habitat for chinook salmon by adding spawning gravel, reconfiguring spawning beds and the river course thorough the filled pond;
- ♦ Increase the quantity and quality of rearing habitat for chinook salmon by increasing available inchannel diversity;
- ♦ Improve river and floodplain dynamics by reconfiguring the channel to better conform with the present flow regime;
- ♦ Enhance riparian and seasonally inundated vegetation by increasing and revegetating floodplain at the project site which will be captured by the river during high flows.

Ecosystem Restoration Importance:

The proposed project revision is critical because it addresses several of the Central Valley anadromous fish and habitat restoration goals identified in the DFG Central Valley Action Plan, USFWS Anadromous Fish Restoration Plan, and the CALFED Ecosystem Restoration Plan. Specifically, the proposed project addresses the Central Valley restoration goals:

Ecosystem Restoration Strategic Goals

- > Goal 1: At Risk Species San Joaquin fall-run chinook salmon; several State and Federal threatened and endangered species and habitat types;
- > Goal 2: Ecosystem Processes and Biotic Communities riverside wetland, floodplain, and native riparian restoration activities;
- > Goal 4: Habitats riverside floodplain, seasonal wetland, and native riparian;
- > Goal 5: Non-native Invasive Species reduce the negative predation impact of introduced recreational warmwater fish species on outmigrating juvenile chinook salmon fish passage.

MSCS/ERP Actions

- < Improved Salmonid Spawning and Rearing Habitats reconfigured salmon spawning area and long-term spawning gravel replenishment;</p>
- < Fishery Monitoring, Assessment, and Research Conduct monitoring and assessment activities which are intended to measure the success of the project as it relates to the intended objectives and whether these objective yield the intended restoration benefits.

Address Scientific Uncertainties

> Decline in Productivity – Project objectives include increased spawning success by providing better quality spawning area; increased juvenile salmon survival by reducing predation by non-native warmwater fish species during smolt outmigration.

- > Channel Dynamics, Sediment Transport, Riparian Vegetation project technology utilizes reconfigured channel dynamics and augmented sediment transport manipulation to achieve intended habitat benefits. Native riparian and wetland vegetation is a part of the required stream corridor reconstruction effort.
- > Beyond the Riparian Corridor Habitat easements which will address future land use, such as purchasing mining rights and cattle grazing, will be obtained.

Other Topic Areas

< Local Watershed Stewardship – Current landowner negotiations have reached a very positive level of cooperation. This cooperation will serve as an positive example for future habitat restoration activities which will most probably require adjacent landowner cooperation.</p>

2. <u>RELATIONSHIP TO OTHER ECOSYSTEM RESTORATION PROJECTS</u> and

3. REOUESTS FOR NEXT-PHASE FUNDING:

As previously stated, this project will implement the second project phase of the five phase Merced River Salmon Habitat Enhancement Project: River Miles 40 to 43.5 which will protect one of the more important natural chinook salmon spawning reaches on the Merced River. Preliminary feasibility design and planning for the original 3.5 mile project area (previously identified in the 1998 project proposal as Phase 1 of the Merced River Salmon Habitat Enhancement Project) was completed in 1996 by DWR with guidance from DFG Region 4 staff. The Phase 1 project (cost-shared with both DWR. Four Pumps, CALFED, and AFRP funding), the Ratzlaff Site, completed construction of the most downstream section of the Merced River Project during the summer of 1999. A completed engineering report is available (CDWR, 2000). The Merced River Project Phase 2 site, the proposed Robinson Site project, is at the very upstream portion of the project site and includes a very complex suite of restoration actions. It is not only the largest planned restoration site (almost 2 miles in length), but it also includes significant channel reconfiguration, creation of a large floodplain, massive material manipulation, berm reconstruction, and hydrodynamic coordination with CalTrans bridge reconstruction. Additional phases are currently being planned to complete reconstruction of the entire 4-mile salmon spawning reach.

Although there are two separate project sites remaining, it is possible that they may be constructed and funded as a single project. Biological and physical monitor activities as well as floodplain revegetation tasks are anticipated to link together with each other as the sites are constructed. Pictures of the recently constructed Phase 2 Ratzlaff Site are included in this proposal for your review (Attachment 7).

4. PREVIOUS RECIPIENTS OF CALFED OR CVPIA FUNDING:

- 1. "Phase 1 Merced River Salmon Habitat Enhancement: River Mile 40 to 40.5 (Robinson/Gallo Project Ratzlaff Reach Site)"
- ► Project Status: completed in September 1999.
 - Ratzlaff AFRP-USFWS Agreement. Doc. Control # 11332-9-J023
 - Ratzlaff CALFED/USBR Cooperative Agreement # 99FC200235
 - Ratzlaff CALFED/USBR CALFED Directed Action # 99-B05
- 2. "Phase 2 Merced River Salmon Habitat Enhancement: River Mile 42 to 43.5 (Robinson Ranch and Gravel Mining Permit #307 sites)"
- Project Status: needs additional funding needed, planning process on track for Spring 2001 construction.
 - Robinson CALFED/USFWS FWS Agreement # 114209JO32
 - Robinson CALFED/USFWS Doc. Control # 11420-9-J045

- 3. "Phase 3 Merced River Salmon Habitat Enhancement: River Mile 40 to 40.5 (Robinson/Gallo Project Lower Western Stone Reach Site)"
- ► Project Status: Planning, 2003-4 construction??
 - LW Stone AFRP-USFWS Agreement Doc. Control # 11332-9-J024
 - Four Pumps (CDWR) funding available, but additional funding is needed for construction.

E. Qualifications

The CDFG is the legislative mandated "trustee of the State's fish and wildlife resources" and has for several decades been involved with salmon restoration actions within California. Specific to the Central Valley, since the 1986 Delta Fish Protection Agreement (Four Pumps Agreement) between CDFG and CDWR, the Four Pumps program has been instrumental in facilitating several salmon restoration actions within the San Joaquin and Sacramento River tributaries. The Four Pumps Program is unique in that it allow the two agreement parties, CDFG and CDWR, to draw upon the specialized talents and expertise which are available within the two California Resources Agency Departments. During the ten-year existence of the program, the quality of projects and staff capabilities of the program has increased significantly with program experience and stakeholder involvement. Four Pumps restorations actions within the Central Valley continue to remain in the forefront of Central Valley salmon restoration planning efforts. Following are qualifications of the identified project contacts:

Biology Coordination - Rhonda J. Reed, Environmental Specialist IV for DFG-San Joaquin Region. (M.S. Ecology; B.S. Wildlife and Fisheries Biology). Present position serves at liaison for CDFG and US Fish and Wildlife Service - Anadromous Fish Restoration Program to implement habitat restoration projects to increase natural production of anadromous fish in the San Joaquin River system. Using partnerships, restoration actions range from simple gravel additions to major river channel reconstruction, scientific evaluations, education and local watershed planning. 1991-1998 she lead CDFG efforts to enhance endangered species recovery through developing and implementation of multi-species habitat conservation plans, in Kern County, the Western Mojave Desert and Metropolitan Bakersfield areas. The remainder of her 19+ year career with CDFG includes commercial fishing gear evaluations to resolve sport/commercial use disputes; reservoir fishery assessments; education and outreach; and population studies of the Santa Cruz long-toed salamander to address land use conflicts.

Engineering Coordination - Kevin Faulkenberry, Associate Engineer (Registered) in CDWR San Joaquin District. Currently Mr. Faulkenberry manages the San Joaquin District's salmon habitat restoration program. While working to manage this program, Mr. Faulkenberry has developed many cooperative relations with local, State and federal agencies that have proven to be instrumental in all phases of project development and implementation. Mr. Faulkenberry has five years of experience in planning, permitting, surveying, design, and construction management of river restoration projects on the San Joaquin River system while working for the Department of Water Resources. Familiar with gravel replacement, predator habitat isolation, floodplain restoration and backwater stabilization, Mr. Faulkenberry has completed numerous successful projects on the Stanislaus, Tuolumne, Merced and San Joaquin Rivers. Mr. Faulkenberry also has training in developing hydraulic models for HEC-2, flow-frequency and sediment-transport analysis.

<u>Project Development Coordination</u> - Fred Jurick, Associate Fishery Biologist (M.S. Natural Resource Management; B.A. Marine Biology) in CDFG Inland Fisheries Division. Mr. Jurick has served as the

CDFG Four Pumps Salmon Coordinator since 1993 and the Federal Tracy Fish Mitigation Agreement Coordinator since 1996 with responsible for coordinating with the CDFG/CDWR field staff to develop and facilitate salmon restoration projects. These activities include, among others, coordination of project planning efforts, preparing project proposals, secure funding approval, prepare environmental documentation, acquire project permits, and coordinate environmental compliance activities.

<u>Financial Coordination</u> - Stephani Spaar is an ES IV (M.S. Fisheries Biology) in DWR's Environmental Services Office. Ms. Spaar has been with DWR since 1987 in various positions with included Four Pumps Program staff biologist 1988-1990, leadperson for various Interagency Ecological Program estuarine fisheries studies 1987-1994. In 1999, Ms. Spaar became the CDWR Four Pumps Program Manager. Current position with the Four Pumps Program (1994- present) involves project management and coordination of various aspects of implementation for numerous fish mitigation projects. Responsibilities include preparation and management of contracts (up to \$2.5 million per contract) and budgets (up to \$27 million for one project), coordination with non-Four Pumps funding on cost-share projects, project tracking and scheduling, and close coordination with CDFG and other DWR divisions on permitting, engineering, and other aspects of project implementation.

<u>Financial Coordination</u> - Aric Lester is an ES I in DWR's Environmental Services Office, and has been with DWR since 1998. Currently, Mr. Lester assists Stephani Spaar in project management, preparation and management of contracts and budgets. In addition, Mr. Lester is involved in planning, acquiring permits, and preparing environmental documentation for other projects in the Delta. Before coming to DWR, he was employed by the USDA Forest Service as a wildlife biologist and was involved in permitting and environmental documentation for watershed scale forest management projects.

F. COST:

1. <u>Budget</u>: Below is a budget summary for the proposed project:

Original 1998 project budget included the following:

CALFED Request
Four Pumps Preliminary Engineering
Four Pumps Project Obligation

DFG Proposition 70 funding

AFRP

Estimated Total Project Cost

Revised 2000 project budget (34% increase):

CALFED secured

Four Pumps Preliminary Engineering

Four Pumps Project Obligation DFG Proposition 70 funding

AFRP

Cost Increase Shortfall

Estimated Total Project Cost

\$2,443,759 (approved)

40,000 (secured and spent)

2,693,800 (secured)

250,000 (secured)

249,959 (anticipated)

\$5,677,518

\$2,443,000 (contracting

in place w/CDWR)

40,000 (secured and spent)

2,693,800 (secured)

250,000 (currently spending)

500,000 (contingent FFY00)

<u>1,949,101</u>

\$7,875,901

Proposed Project Budget:

Current funding CALFED

in-place w/CDWR) Four Pumps Preliminary Engineering 40,000 (secured and spent) 2,693,800 (secured/available) Four Pumps Project Obligation DFG Proposition 70 funding 250,000 (currently spending) Additional funding * Additional Four Pumps Obligation 500,000 (anticipated funding)

* DFG-Tracy Funding (FFY01) 250,000 (anticipated funding)

2001 Proposal Solicitation Request

* Additional CALFED Obligation

*AFRP (FFY01)

* Additional AFRP (FFY02)

Estimated Total Project Cost

699.101 (2001 PSP request) 500,000 (PSP request FFY01)

\$2,443,000 (secured, contract

500,000 (PSP request FFY02) \$7,875,901

A detailed explanation of the above budget identifying project elements costs is presented in Attachment 8. Additional budget information including proposed project tasks and fiscal year expenditures is presented in Attachment 9.

2. Cost-Sharing: See Attachment 9.

G. LOCAL INVOLVEMENT

At the beginning of this year, the proposed project staff began a series of project stakeholder advisory/review committee discussions. The first meeting was held at the Stanislaus County Agricultural Center in Modesto, California. The first meeting was held on February 22, 2000 and involved about thirty people representing several public and private organizations. The meetings have been divided into two focus groups: Engineering and Environmental Documentation. Both committees included concerned representation from CDFG, CDWR, CalTrans, USFWS, private landowners, and private consultants. The second meeting is scheduled for May 4, 2000 also in Modesto. Meetings are intended to continue until the project is constructed and open to any stakeholder wishing to participate in the final planning and project review. A list of the representation is available on request.

One of the objectives of the Environmental Documentation Committee is to help support and guide the USFWS staff as they complete a Programmatic Environmental Assessment for the entire four mile Merced River Salmon Habitat Enhancement Project. This document is currently scheduled to be completed by the Fall of 2000 when public hearings will begin to comment on the general restoration plan which includes the proposed project.

H. COMPLIANCE with STANDARD TERMS and CONDITIONS

The project participants will comply with state and federal standard terms.

I. LITERATURE CITED

- CDFG, Memo November 23 1987. "Short List of Proposed Measures to Replace Salmon and Steelhead Lost at the South Delta Pumps"; Memorandum from Forrest Reynolds (CDFG Supervisor, Fishery Enhancement Program) to Pete Chadwick (CDFG Chief, Bay-Delta Division).
- EA, September 1990. "Preliminary data from a study of predation of piscivorous fish on young chinook salmon in the lower Tuolumne River, 1990"; preliminary summary report prepared for CDFG by EA Engineering, Science, and Technology Western Division (Lafayette, CA).
- CDFG, Memo September 24 1991. "Draft Short List of Sacramento-San Joaquin River System Habitat Restoration Projects"; included in memorandum from Pete Bontadelli (CDFG Director) to Mr. Ted Selb, Merced, CA (local landowner and stakeholder).
- CDFG, November 1993. "Restoring Central Valley Streams: A PLAN FOR ACTION"; Compiled by Forrest L. Reynolds, Terry J. Mills, Randy Benthin, and Alice Low.
- J. Vick, 1995. "Habitat Rehabilitation in the Lower Merced River -- Volume 1 & 2", Center for Environmental Design Research, Publication No. CEDR-03-95 & CEDR-04-95, June 1995, University of California, Berkeley, CA.
- CDFG, January 1998. "California Salmonid Stream Habitat Restoration Manual"; CDFG, Inland Fisheries Division publication, third edition prepared by Gary Flosi, Scott Downie, James Hopelain, Michael Bird, Robert Coey, and Barry Collins.
- B. Loudermilk, personal communications, 1998 William E. Loudermilk, Senior Biologist Supervisor (Marine/Fisheries), CDFG Region 4, 1234 East Shaw Ave., Fresno, CA.
- J. Williams, 1998. "Thoughts on Adaptive Management" by John G. Williams. In: IEP Newsletter, Vol.1, No. 3, Summer 1998 (Interagency Ecological Program for the Sacramento-San Joaquin Estuary); pages 5-11.
- D. Demko, personal communications, 2000. Doug Demko, consulting biologist for Oakdale Irrigation District. Results communicated are in anticipation of the following publication in progress: "Evaluation of Juvenile Chinook Behavior, Migration Rate and Location of Mortality in the Stanislaus River Through the Use of Radio Tracking December 1998; Prepared for Tri-dam Project Prepared by: Douglas B. Demko, Christine Gemperle, Steven P. Cramer, and Andrea Phillips. S.P. Cramer & Associates, Inc. currently in production.

CDWR, 2000. "Merced River Robinson/Gallo Project - Ratzlaff Reach Engineering Report", California Department of Water Resources San Joaquin District River Management Section.

J. THRESHOLD REQUIREMENTS (Attachment 10)

Copies of notification letters to Merced County Planning Department and Merced Irrigation District have been included;

- ► The CALFED 2001 Proposal Solicitation Package Environmental Compliance Check Sheet has been completed and included;
- ► The CALFED 2001 Proposal Solicitation Package Land Use Check Sheet has been completed and is included;
- The "Application for Federal Assistance" Standard OMB Form 424 has been completed by CDWR and signed by the responsible party.

ATTACHMENT 1

Approved
May 1998 Category III Funding Request
Project Proposal

"Phase 3 – Merced River Salmon Habitat Enhancement: River Miles 42 to 43.5 (Robinson Ranch and Gravel Mining Permit #307 Site)

Phase 3 -- MERCED RIVER SALMON HABITAT ENHANCEMENT: River Miles 42 to 43.5 (Robinson Ranch and Gravel Mining Permit #307 sites)

REQUEST FOR FUNDING From MAY 1998 Category III

ECOSYSTEM RESTORATION PROJECTS AND PROGRAMS

Submitted By:

CALIFORNIA DEPARTMENT OF FISH AND GAME Inland Fisheries Division

In Conjunction with

CALIFORNIA DEPARTMENT OF WATER RESOURCES
Four Pumps Program

Prepared by:

Frederick A. Jurick
Associate Fishery Biologist
California Department of Fish and Game
Inland Fisheries Division

Attachment H

COVER SHEET (PAGE 1 of 2)

May 1998 CALFED ECOSYSTEM RESTORATION PROPOSAL SOLICITATION

Ртоп			n Habitat Enhancement: River Miles <u>Gravel Mining Permit #307 sites)</u>	
-	& Game	•		
	licant Name: California Dept. of ing Address: 1416 Ninth Street Sa			
	phone: 916-657-4226			,
Fax:	036 654 655			•
r av.	4			•
Amo	ount of funding requested: \$\(\frac{2,443,759}{\)		for 2 years	٠.
	cate the Topic for which you are applying page of the Proposal Solicitation Packa	•	ck only one box). Note that this is an import or more information.	ant decision:
	Fish Passage Assessment			•
X	Floodplain and Habitat Restoration		Gravel Restoration	
	Fish Harvest		Species Life History Studies	
	Watershed Planning/Implementation		Education	
	Fish Screen Evaluations - Alternatives an	d Bi	ological Priorities	
	and the state of t			
Indi	cate the geographic area of your proposal	(che	ck only one box):	
	Sacramento River Mainstem	` □	Sacramento Tributary:	
□ ;··	Delta ··· ·		East Side Delta Tributary:	•.•
	Suisun Marsh and Bay	×	San Joaquin Tributary: Merced River	
Ö	San Joaquin River Mainstem	<u> </u>	Other:	
	Landscape (entire Bay-Delta watershed)		North Bay:	-
_			•	
Indi	cate the primary species which the propos	al ad	dresses (check no more than two boxes):	
X	San Joaquin and East-side Delta tributari	es fa	ll-run chinook salmon	•
	Winter-run chinook salmon		Spring-run chinook salmon	
	Late-fall run chinook salmon		Fall-run chinook salmon	
	Delta smelt		Longfin smelt	•
	Splittail		Steelhead trout	
	Green sturgeon		Striped bass	
	Migratory birds			



COVER SHEET (PAGE 2 of 2)

May 1998 CALFED ECOSYSTEM RESTORATION PROPOSAL SOLICITATION

Indi	cate the type of applicant (check only one	box):	:
玆	State agency		Federal agency
	Public/Non-profit joint venture		Non-profit
	Local government/district		Private party
	University		Other:
	٠		•
Ind	icate the type of project (check only one b	ox):	•
	Planning	į	Implementation
	Monitoring		Education
	Research		
	· · · · · · · · · · · · · · · · · · ·	•	
-			
Ву	signing below, the applicant declares the	follov	ving:
(1)	the truthfulness of all representations in	their j	proposal;
(2) app	the individual signing the form is entitle blicant is an entity or organization); and	ed to s	ubmit the application on behalf of the applicant (if
dis	the person submitting the application has cussion in the PSP (Section II.K) and was sposal on behalf of the applicant, to the ex	ives ar	I and understood the conflict of interest and confidentiality by and all rights to privacy and confidentiality of the s provided in the Section.
A	FOR	Ala	an Baracco



(Signature of Applicant)

II. EXECUTIVE SUMMARY

a. Project Title: Phase 3: Merced River Salmon Habitat Enhancement River Miles 42 to 43.5 (Robinson

Ranch and Permit #307 sites).

California Department of Fish and Game and the California Department of Water Applicant:

Resources.

b. <u>Project Description and Primary Biological/Ecological Objective</u>:

The primary objectives of the project include removing salmonid predator habitat and producing and improving spawning and rearing habitat for juvenile salmon. The predator habitat will be eliminated by both filling and isolating existing ponds from the channel. In order to improve spawning and rearing habitat for salmon, the channel will be reconfigured. This will include scaling the channel to fit the post-dam flow regime. Over the entire reach, the channel will be designed to include spawning riffles, runs, and pools, with a meander which fits the approximate slope and bankfull flow of 1,600 cfs. It will also include floodplains which will be replanted with native riparian vegetation.

Specific project biological/ecological objectives are:

Eliminate juvenile salmon predator habitat by filling the unnatural instream pond area;

Increase the quantity and quality of spawning habitat for chinook salmon by adding spawning gravel, reconfiguring spawning beds and the river course thorough the filled pond;

Increase the quantity and quality of rearing habitat for chinook salmon by increasing available inchannel diversity;

Improve river and floodplain dynamics by reconfiguring the channel to better conform with the present flow regime;

Enhance riparian and seasonally inundated vegetation by increasing and revegetating floodplain at the project site which will be captured by the river during high flows.

c. Approach/Tasks/Schedule: The proposed project is on the Merced River between river miles 42.0 and 43.5, just upstream of the Highway 59 bridge (Figure 1). It consists of two of the five reaches of the Merced River Salmon Habitat Enhancement Project (Merced River Miles 40 to 43.5) which is being engineered for restoration by the Delta Pumps Fish Protection Program (CDWR and CDFG). Much like the entire 3-mile section of the river, prior to 1997, the proposed project consisted of a narrow channel confined between levees and contained several in-stream ponds (captured mining pits). After the high flows of January 1997, the proposed project site now consists of a wide, flat, shallow upstream river reach devoid of proper channel characteristics with several in-stream ponds in the downstream portion of the reach. The current river alignment bypasses much of the original channel, and therefore much of the coarse sediment which provides for existing salmon spawning and rearing habitat.

The project will include scaling the channel to fit the post-dam flow regime. Over the entire reach, the channel will be reshaped to include spawning riffles, runs, and pools, with a meander which fits the approximate slope and bankfull flow of 1,600 cfs. The floodplains will be replanted with native riparian vegetation. The upstream section of the project will consist of the reconstructed river channel, floodplains, and high terraces, while the downstream reach will use berms to isolate two ponds. The berms will be constructed to exclude a flow of at least 8,000 cfs (30 year event), and will include unique state-of-the-art "equalization saddles" and bank protection to minimize damage during high flows. Proposed project schedule is as follows (progress reports on construction, budget and monitoring will be submitted quarterly):

+ Begin environmental documentation and permitting, access agreements; Winter 1999

+ Pre-project monitoring - finalize planning;

+ Final engineering designs (specifications and cost estimate);

Spring 1999 Winter 2000 - Begin monitoring;

+ Complete environmental documentation and permitting

+ Pre-construction activity, final cost estimate, bid specifications;

LOCATION MAP

Merced River Robinson Site

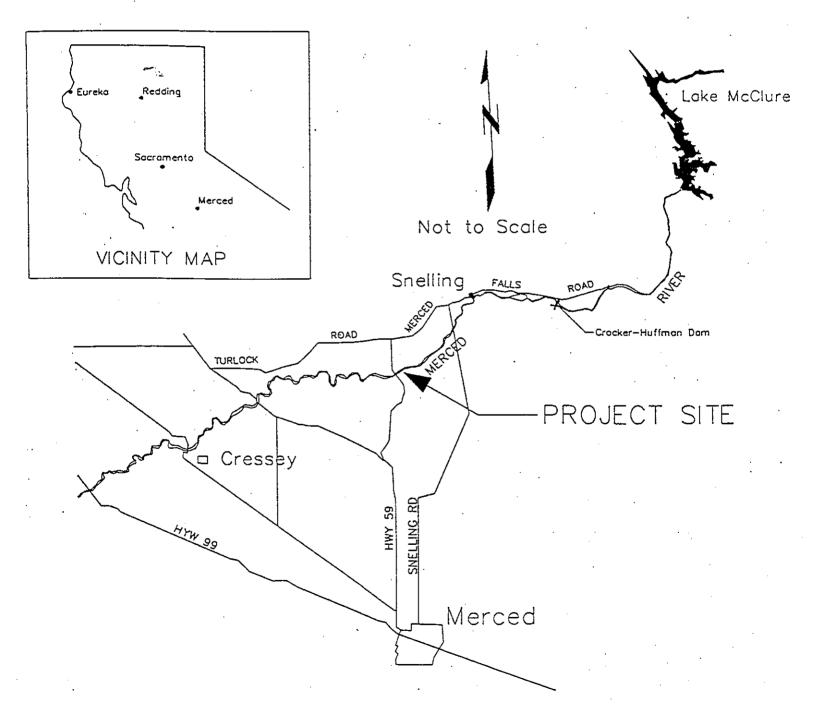


Figure 1

Spring 2000 + Construction contracting (bid documents, advertise, award bid);

Summer 2000/01 - Project Construction (3 mo. between JUN-SEP)

- Construction management and survey

+ Begin post-project monitoring Fall-Winter 2000/01

+ Begin revegetation were possible

Fall 2001 - Complete Project Construction

- Continue post-project monitoring

2000-2002 + Revegetation activities

+ Post-project monitoring

+ Evaluate project/maintenance recommendations

* Continue project monitoring and project with adaptive maintenance 2001 - 2012

d. Justification for Project and Funding by CALFED: The proposed project has been identified as a priority salmon restoration action in the following Central Valley salmon restoration planning documents: "Anadromous Fish Restoration Plan - Revised Draft Restoration Plan for the Anadromous Fish Restoration Program" (May 30, 1997); "California Department of Fish and Game "Restoring Central Valley Streams: A Plan for Action" (November 1993); "Joint CALFED/SJRMP San Joaquin River Fishery Technical Team Meeting Report (Preliminary Draft, February 13, 1997); "Comprehensive Needs Assessment for Chinook Salmon Habitat Improvement Projects in the San Joaquin River Basin" -- March 1994; San Joaquin River Management Plan (February 1995).

Budget Costs:

Total Project Cost:

\$5,677,518

Amount requested from CALFED: 2,443,759

Cost/share

\$3,233,759*

*This is based on a \$540,000 minimum Four Pumps Program contribution which may increase. Additional in-kind contribution towards environmental documentation is being discussed with CalTrans.

Third Party Impacts: None anticipated at this time.

- f. Applicant Qualifications: The proposed project has been planned and developed by the CDFG/CDWR Four Pumps program which has been instrumental in facilitating several salmon restoration actions within the San Joaquin and Sacramento River tributaries. During the ten-year existence of the program, the quality of projects and staff capabilities of the program has increased significantly with program experience and stakeholder input. Four Pumps restorations actions within the Central Valley continue to remain in the forefront of Central Valley salmon restoration planning efforts.
- g. Monitoring and Data Evaluation: To evaluate the project success, adapt and maintain the project over the engineered life of the project; it is necessary that a monitoring program be included to address the identified project objectives. Currently, a finalized monitoring program is being prepared and the basic monitoring objectives have been identified.
- h. Local Support/Coordination with other Programs/Compatibility with CALFED Objectives: The local landowner is supportive of the proposed project. The proposed project was identified by the CALFED San Joaquin River Fishery Technical Team at the January 1997 Bass Lake planning workshop as a specific project need on the Merced River. Further, the proposed project has been identified specifically or in concept within several Central Valley chinook salmon planning documents including the USFWS Anadromous Fish Restoration Plan and the CDFG Restoring Central Valley Streams: A Plan for Action. The proposed project is located in the CALFED San Joaquin Watershed Basin; targets the Priority Species San Joaquin tributaries fallrun chinook salmon; and addresses improvements to Priority Instream Aquatic Habitats, Seasonal Wetland, and Shaded Riverine Aquatic Habitat.

III. TITLE PAGE

a. Project Title: Phase 3: Merced River Salmon Habitat Enhancement, River Miles 42 to 43.5

(Robinson Ranch and Permit #307 sites)

b. Applicant: California Department of Fish and Game

<u>Principal Investigator</u>: Alan Baracco, Assistant Division Chief

Inland Fisheries Division

1416 Ninth Street, Sacramento, CA 95814

Telephone: (916) 653-4729 FAX: 916-653-8256

Internet E-mail: abaracco@hq.dfg.ca.gov

c. Type of Organization and Tax Status: State of California -- tax exempt

d. Tax Identification Number: 94-1697567 for DFG; 52-1692634 for DWR

e. Technical and Financial Contact Person(s):

Biology- Clarence Mayott, Associate Fishery Biologist - Region 4

California Department of Fish and Game 1234 East Shaw Avenue, Fresno, CA 93710

Telephone: (209) 243-4005, ext. 171 FAX: 209-243-4022

Internet E-mail: 103506.545@compuserve.com

Engineering Kevin Faulkenberry, Associate Engineer - San Joaquin District

California Department of Water Resource 3374 East Shields Avenue, Fresno, CA 93726 Telephone: (209) 445-5236 FAX: 209-445-5370

Internet E-mail: faulkenb@sid.water.ca.gov

Coordination Fred Jurick, Associate Fishery Biologist - Inland Fishery Division

California Department of Fish and Game 1416 Ninth Street, Sacramento, CA 95814

Telephone: (916) 657-4227 FAX: 916-654-8099

Internet E-mail: fjurick@hq.dfg.ca.gov

Financial Stephani Spaar, Environmental Specialist IV

& Kris Vardas, Environmental Specialist III

piect Environmental Services Office

Project Environmental Services Office

Management California Department of Water Resources

3251 S street, Sacramento, CA 95816-7017

Telephone: (916) 227-7536

Internet E-mail: sspaar@water.ca.gov

f. Participants/Collaborators in Implementation:

* US Fish and Wildlife Service CVPIA-AFRP * Proposition 70 Advisory Committee

* Four Pumps Agreement Advisory Committee * San Joaquin River Management Program

g. RFP Project Group Type: Construction

IV. PROJECT DESCRIPTION

a. Project Description and Approach: Because this degraded section of the Merced River impacts a significant portion of the river's natural salmon production, DFG personnel have been in discussions with Merced River with Merced County Planning Department, Western Stone and Gravel Inc., and the Robinson family to repair this important section of the Merced River for the last decade. To facilitate a solution, approximately 3-years ago, the DWR/DFG Four Pumps Program committed funding for DWR engineering staff to work with DFG staff to develop river "fixes" on this severely degraded 4-mile section of the Merced River (River Miles 40.0 to 43.5). The DFG/DWR feasibility engineering team divided the river section into 5 potential project river reaches and preliminary engineering and design has been completed on four of these identified reaches. Recent weather events and landowner support of the project design have elevated the proposed project site (Robinson Ranch and Gravel Mining Permit #307) to a priority action by the DFG habitat restoration staff.

The proposed project will be Phase 3 (Phase 1 was the feasibility engineering and design, Phase 2 will be construction of the Ratzlaff Project by the Four Pumps Program in 1999) of the currently planned Expanded Merced River Salmon Habitat Enhancement Project and would restore two of the five identified reaches. The DWR Four Pumps has already expended approximately \$100,000 towards completion of Phase 1 and has obligated approximately \$3.7 Million towards future construction of two of the remaining three identified restoration sites.

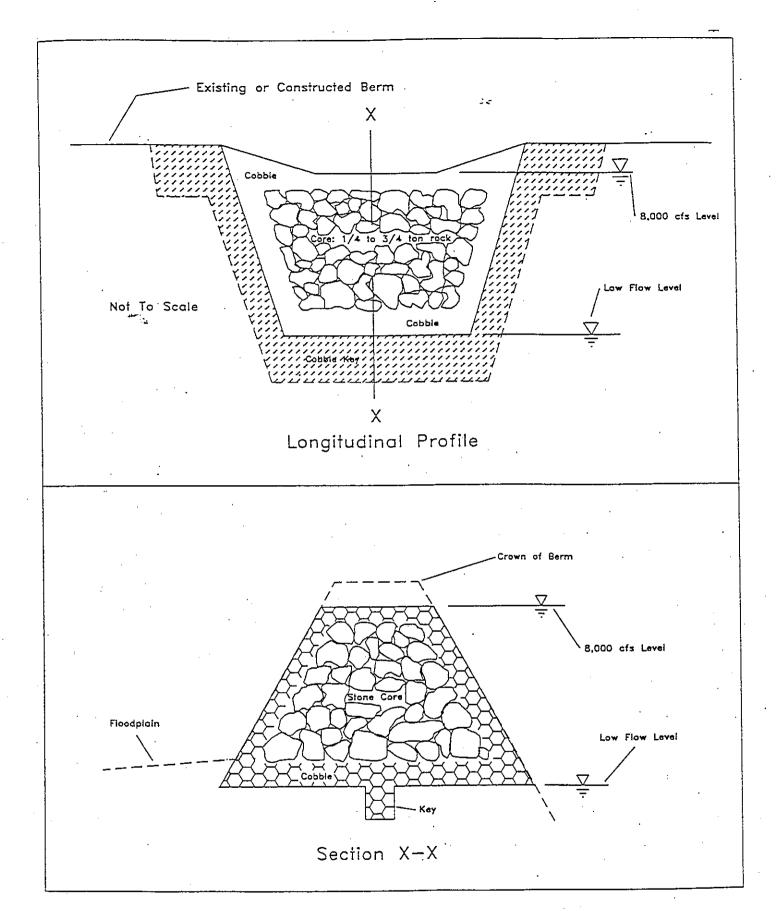
The proposed project site consists of two of the five reaches of the Expanded Merced River Salmon Habitat Enhancement Project. The two reaches are described in Merced County Gravel Mining Permits #597 and #307. Before 1997, this reach consisted of a narrow channel confined between levees and contained several in-stream ponds. After the high flows of January 1997, it consisted of a wide, flat, shallow upstream reach devoid of proper channel characteristics, and several in-stream ponds in the downstream reach. The current alignment bypasses much of the original channel, and therefore much of the coarse sediment and existing spawning and rearing habitat.

The objectives of the project include removing predator habitat and producing and improving habitat for salmon. The predator habitat will be eliminated by both filling and isolating ponds from the channel. In order to improve spawning and rearing habitat for salmon, the channel will be reconfigured (Figure 4). This will include scaling the channel to fit the post-dam flow regime. Over the entire reach, the channel will be designed to include spawning riffles, runs, and pools, with a meander which fits the approximate slope and bankfull flow of 1,600 cfs. It will also include floodplains which will be replanted with native riparian vegetation. The upstream section (Permit #597) will consist of the constructed channel, floodplains, and high terraces (inundated at 100 year event, 12,000 cfs). The downstream reach (Permit # 307) will not include terraces, but will use berms to isolate two ponds. The berms will be constructed to exclude a flow of at least 8,000 cfs (30 year event), and will include "equalization saddles" and bank protection to minimize damage during high flows (figures 2 and 3).

Design specifics include:

- a. Pond area removed: 64.9 acres (35.7 ac filled, 29.2 ac isolated)
- b. Length of modified channel: 9,400 ft
- c. On-site material volume to be manipulated: 415,000 yd³
- d. Volume of material to be purchased: 191,000 yd³
- e. Total area suitable for spawning to be constructed (as per California Salmonid Stream Habitat Restoration Manual, January 1998): 21,900 yd²

Although there is on-site material which is suitable for use in the constructed channel, site surveys show that a large portion of the proposed alignment will pass through areas which have been mined of gravel resources, leaving mostly clays. Between station 28+00 and 56+00 of the proposed channel alignment will require extensive manipulation and replacement of substrate in order to provide an adequate and stable base for spawning riffles, runs, and pools (Figures 4-8).



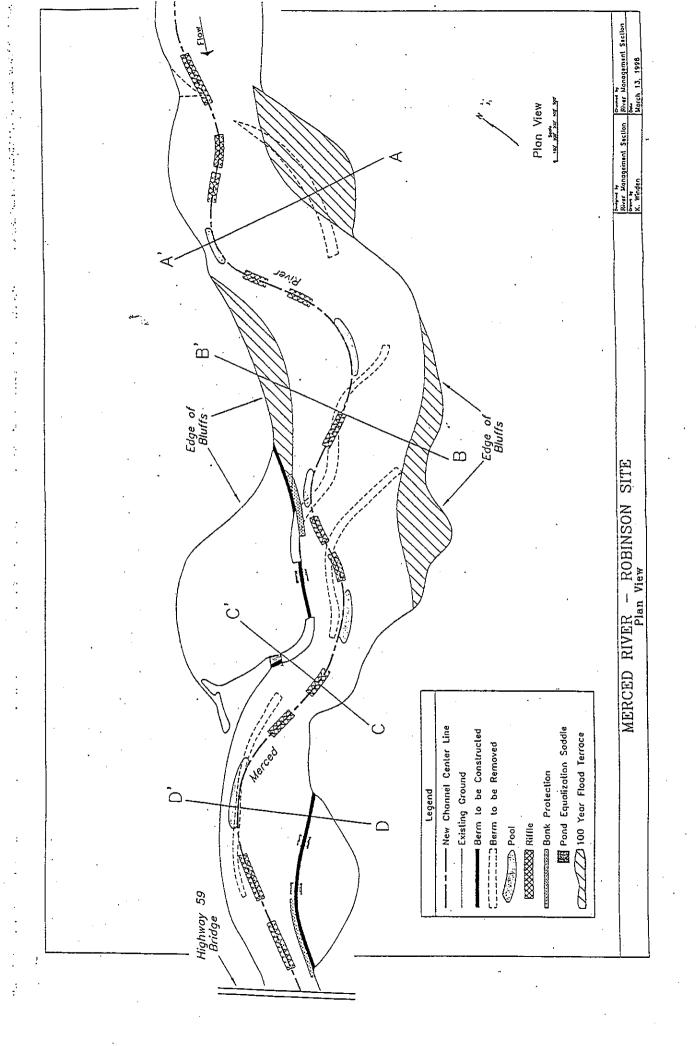
Detail — Equalization Saddle

Figure 2

Bank Protection

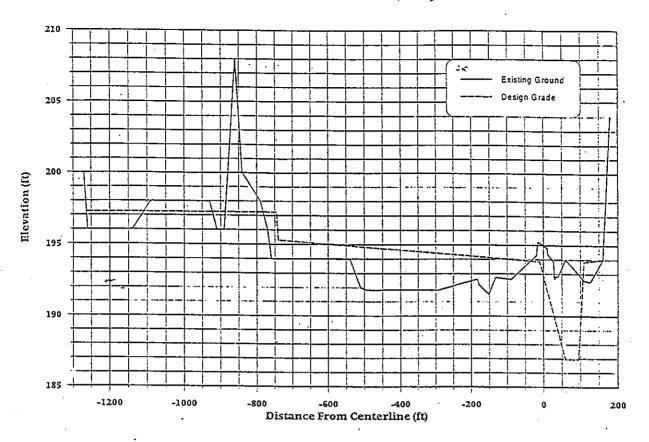
Detail

Figure 3

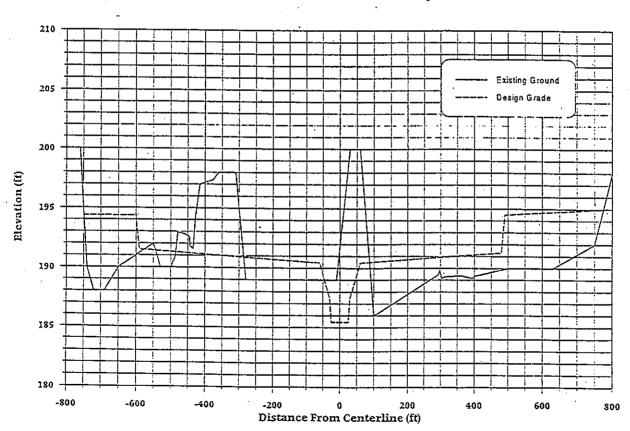


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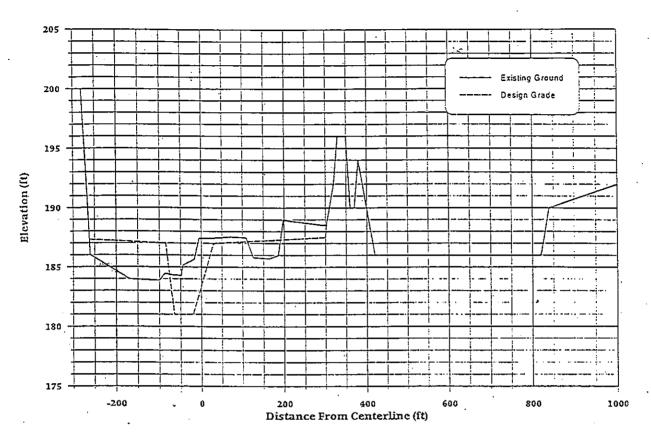
Cross-Section A-A' - Robinson Project



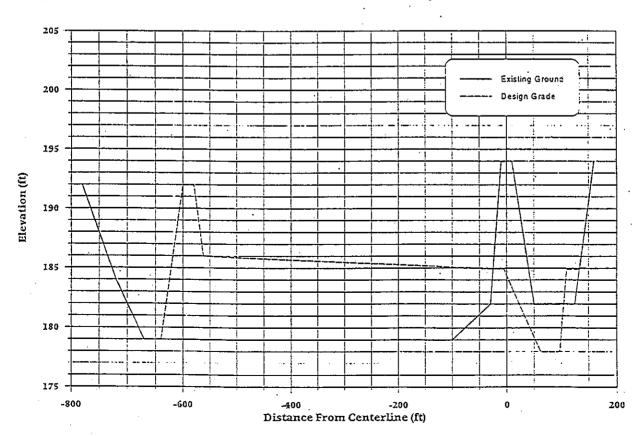
Cross-Section B-B' - Robinson Project

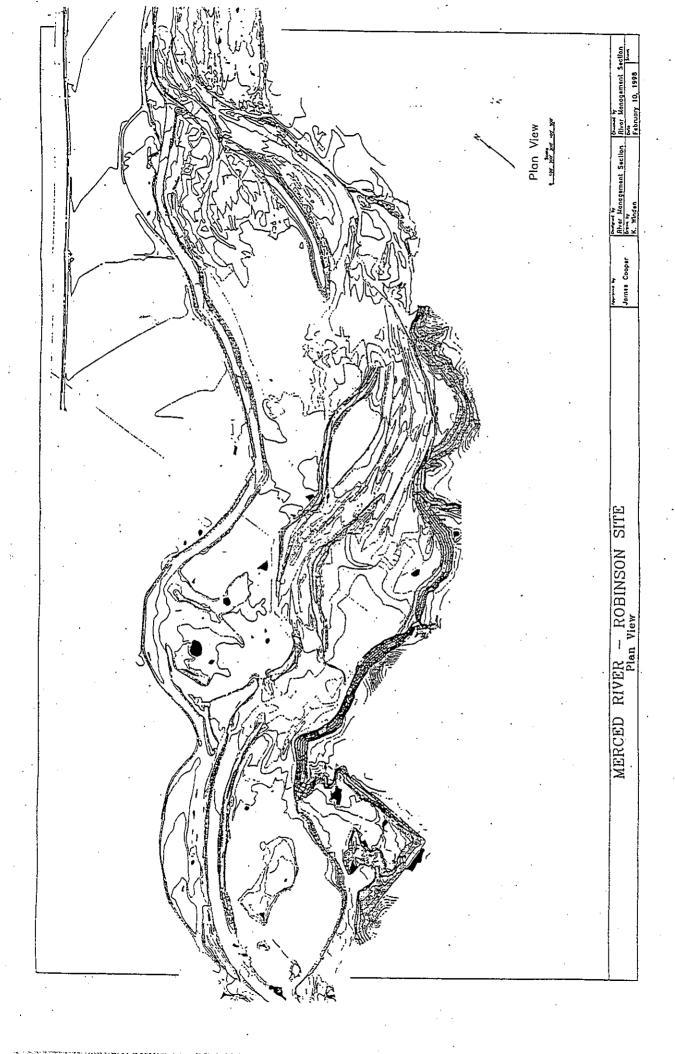


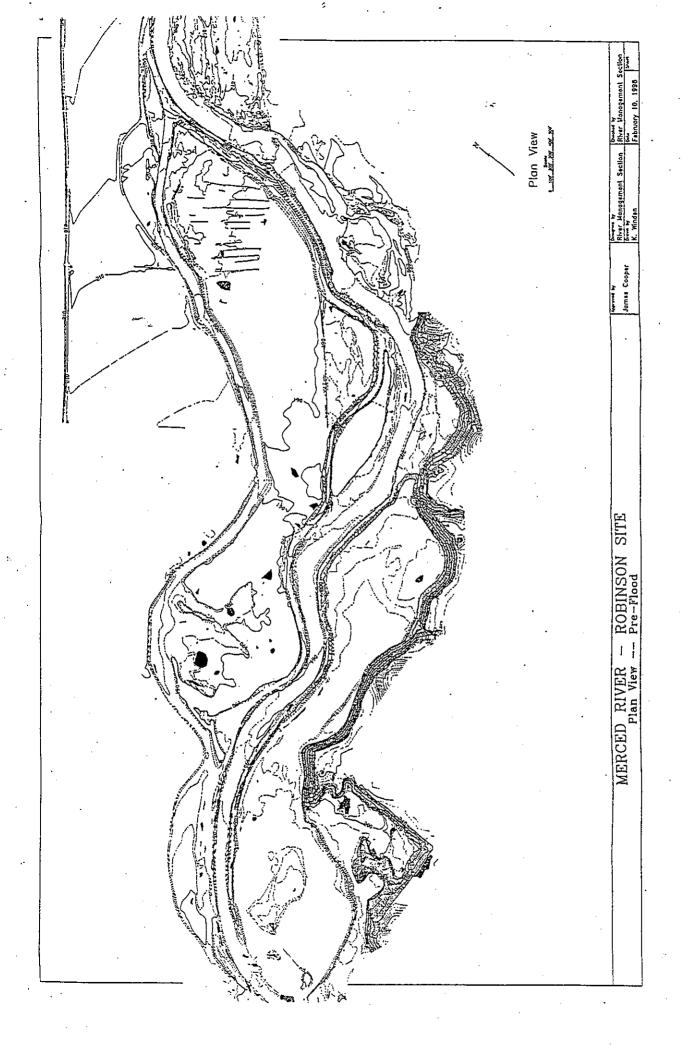
Cross-Section C-C' - Robinson Project



Cross-Section D-D' - Robinson Project







b. Proposed Scope of Work:

Proposed Project Schedule: (See Table 1)

Deliverables:

- Quarterly Progress Reports Construction, financial, monitoring, etc.
- (First report Feb 15, 2000 for Oct-Dec 1999)
- Detailed Monitoring Plans Fisheries, Geomorphic, Revegetation (Fall 1999-Winter 1999)
- Pre-project baseline monitoring report (Fall 2000)
- Preliminary (completed) and final engineering designs, cost estimate, bid specs (Winter 2000)
- Project environmental documentation and permits CEQA/NEPA (Winter 2000)
- Project supervision and construction report (Fall 2001)
- Post-Project monitoring for two years with end of year reports (Dec 2001, Sep 2002)
- Project evaluation and maintenance recommendation (2002).
- c. Location and /or geographic boundaries of project: The proposed project is in the San Joaquin Watershed Basin, on the Merced River between river miles 42.0 and 43.5, just upstream of the Highway 59 bridge in Merced County (See Locator Map, Figure 1).

: 5

d. <u>Expected Benefits</u>: The proposed project targets the Priority 1st Tier Species San Joaquin tributaries fall-run chinook salmon (USFWS species of concern); conforms to Implementation Strategy Priority Habitats #2 Seasonal wetland and aquatic, #3 Instream aquatic habitat, and #4 Shaded riverain aquatic habitat; and addresses the identified Stressors of Floodplain and Marshplain Changes (High Priority), Channel Form Changes (High Priority), and Undesirable Species Interactions (Medium Priority).

Primary Project Benefits are:

- ♦ Eliminate juvenile salmon predator habitat by removing 64.9 acres of unnatural instream pond;
- ♦ Increase the quantity and quality of spawning habitat for chinook salmon by modifying 9400 feet of channel to create 21,900 square yards of spawning habitat; reconfiguring spawning beds and the river course thorough the filled pond;

Secondary Project Benefits are:

- ♦ Increase the quantity and quality of rearing habitat for chinook salmon by increasing available in-channel habitat diversity;
- ♦ Improve river and floodplain dynamics by reconfiguring the channel to better conform with the present flow regime;
- ♦ Enhance riparian and seasonally inundated vegetation by increasing and revegetating floodplain at the project site which will be captured by the river during high flows.

The proposed project objects address the following primary Ecosystem Restoration Stressors:

- <u>Identified Stressor</u> "Alteration of Flows" (High Priority) -- The project proposes to reduce the effect of a migration barrier to downstream salmon smolt migration by reducing a potential predation risk/opportunity by small and largemouth bass;
- ▲ Identified Stressor "Floodplain and Marshplain Changes" (High Priority) The project proposes to repair/enhance an important section of the Merced River which has been severely confined and altered due to past gravel mining activities and breached levees. The project intends to reestablish a functional floodplain at the project site by filling 36 acres of the existing instream pond. The enhanced floodplain is intended to increase gravel recruitment, stimulate fine deposition on the floodplain rather than on the river bottom, and increase available nutrients to the river system.;
- <u>Identified Stressor</u> "Channel Form Changes" (High Priority) -- Alterations of Channel Form have resulted in a lack of floodplain, degradation of instream habitat conditions, loss of lotic conditions, reduced suitability (unnatural) of in-channel corridor habitat for salmon and native wildlife species due to changes in hydraulic conditions, cover, and predation risk. Proposed stream channel manipulations are aimed at improving channel complexity, reducing substrate armoring, and increasing available gravel recruitment.

TABLE 1. MERCED RIVER SALMON HABITAT ENHANCEMENT RIVER MILES 42 to 43.5

									1,3	-			0000			
	1999				2000				2001	•			2002			
TASK	JAN-MAR	JAN-MAR APR-JUN JUL-SEP	JUL-SEP	OCT-DEC	JAN-MAR	APR-JUN	JUL-SEP	OCT-DEC	JAN-MAR	APR-JUN	JUL-SEP	OCT-DEC	JAN-MAR	APR-JUN J	JUL-SEP (OCT-DEC
PRELIMINARY SURVEYS & ENGINEERING	COMPLE	COMPLETED 6/98														
FINAL DESIGN AND ENGINEERING																
ENVIRONMENTAL DOCUMENTS & PERMITS																
					SPECS	BID	CONTRACT	ACT	MGMT>>>>	>>>>						
COST/SPECS, BID PROCESS, CONTRACT MGMT												+++				
CONSTRUCTION						NOC				NOC .						
CONSTRUCTION MANAGEMENT & SURVEY						Nnr		+++	+++	+++		† + +				
REVEGETATION & MONITORING (2012)							+++	DEC		+ + +	+++	DEC				
		< <u>\</u>		¥	< >>	^		REPORT		\$		REPORT		<u>ш</u>	REPORT	
PROJECT EVALUATION & MONITORING																
								•						-	-	
PROJECT MANAGEMENT																-
MAINTENANCE & RECOMMENDATIONS													****			
QUARTERLY PROGRESS REPORTS				•	*		٠	٠	٠	٠	•	•	•	•		
						.,-						·				
CALEED CONTRACT																

1 - PRE-PROJECT MONITORING - Fisheries, Geomorphic, Vegetation NOTE:

2 - POST PROJECT MONITORING:

Spawning/Rearing - Same + every 5 years for 15 years, annual redd counts - Fisheries: Predator Removal - Spring & Fall for 2 years

+++ ACTIVITY AS NEEDED/POSSIBLE

- Geomorphic: After SEP 2001 (post-construction) & after 5, 10, 15 year

- Revegation: 10 year period in accordance with ACOE permit

QUARTERLY REPORTS to CALFED by mid-quarter for previous quarter

▲ <u>Identified Stressor</u> "Undesirable Species Interactions" (Medium Priority) — The immediate benefit of the proposed project would be to reduce small and largemouth bass predation of salmon fry and juveniles during rearing and downstream outmigration.

The proposed project has been identified specifically or in concept by the following California Central Valley chinook salmon restoration planning documents, and would provide potential benefits to these restoration programs:

- Anadromous Fish Restoration Plan (AFRP) Revised Draft Restoration Plan for the Anadromous Fish Restoration Program (May 30, 1997) -- Merced River (page 85).
 <u>ACTION 3</u> -- Improve watershed management to restore and protect instream and riparian habitat, including consideration of restoring and replenishing spawning gravel -- High Priority.
 <u>EVALUATION 2</u> -- Evaluate and implement actions to reduce predation on juvenile chinook salmon, including actions to isolate "ponded" sections of the river -- Medium Priority.
- ► CDFG "Restoring Central Valley Streams: A Plan for Action" (Nov. 1993); Priority A-1.
- ► Joint CALFED/SJRMP San Joaquin River Fishery Technical Team Workshop Report (April 2, 1997) -- Project #2;
- ➤ CDWR and CDFG "Comprehensive Needs Assessment for Chinook Salmon Habitat Improvement Projects in the San Joaquin River Basin" -- March 1994 -- (page 21-22 and 87-92), High Priority ranking.
- ► San Joaquin River Management Plan (February 1995) -- page 22-23, 90-91:.
- e. <u>Background and Ecological/Biological/Technical Justification</u>: The Merced River has undergone extensive modification over the years to provide agricultural and municipal water supply, flood control, and power generation, as well as raw materials such as gravel products and gold. As early as the 1870's, large canal systems were built to divert Merced River water for agricultural uses. Several dams were built to regulate flows, the largest being New Exchequer Dam (completed in 1967) which can store up to 1,032,000 acre-feet of water in its reservoir. Mining for gold and aggregate downstream of the dams has been extensive, leaving tailings and numerous pits within the river corridor.

The manipulation of the river has led to loss and degradation of native habitat. With the building of dams, access to spawning grounds upstream has been lost, and gravel recruitment is greatly reduced in reaches below the dams. The large in-stream ponds left by mining create habitat for introduced predator fish species which prey upon juvenile salmon. In an effort to better understand those problems influencing salmon production in the Merced River, CDFG biologists have identified several factors which, in concert, seem to have contributed to the decline of San Joaquin fall-run chinook salmon. Among those identified factors are degraded channel, poor gravel composition, low flows, high water temperatures, low intragravel oxygen content, predation on outmigrating juvenile salmon by warmwater fish such as large and smallmouth bass, and insufficient spawning habitat (CDFG, November 1993; CDFG Memo September 6, 1991, CDFG Memo November 23, 1987). Specific to the proposed project site, CDFG biologists estimate that 25 percent of the annual Merced River natural salmon spawning and production occurs upstream of this site (B. Loudermilk, personal communication). This logically implies that a significant portion of the Merced River annual production of natural outmigrating salmon juveniles must successfully negotiate this man-made hazard.

Flow regulation leads to reduced peak flows and an overall reduction in the average flow in the river. These result in a general narrowing of the channel (J. Vick, 1995). The two-year flow event before dam construction (pre-Exchequer) was approximately 16,000 cfs (Exchequer gage). Flow records show that since New Exchequer Dam began operation, the two year event is approximately 2,300 cfs (Snelling gage). This means that the high flows which traditionally scoured and flushed vegetation from active gravel bars and banks and delivered coarse sediment are all but absent. As a result there is encroachment of vegetation which leads to narrowing and armoring of the channel.

A loss of gravel recruitment to the lower reaches of the river can also be attributed to dams. The river is "sediment starved" during higher flows, and tends to recruit sediment from channel banks and beds. Over time this results in channel degradation, which when combined with reduced flow can further narrow the channel and lead to abandoned floodplains. Prior to the January, 1997 flood event, the reach of Merced River between the Highway 59 bridge and Snelling (within which this project falls) had shown little evidence of degradation,

although reaches both upstream and downstream of it appeared to be degrading (J. Vick, 1995). During the 1997 event the berms which had confined the river to the historic channel in the project reach (RM 42 to 43.5) were breached, and as a result the river abandoned its channel in favor of a gravel pit with an invert approximately six feet lower. This abandonment of the channel resulted in the loss of several salmon spawning riffles and much of the existing nursery habitat.

The original problem in the project reach consisted of a narrow channel confined by levees with in-stream ponds and no floodplain. With the 1997 flood event came several major changes to the reach when the river breached the levees which had confined it. As a result, the problem has changed to one of a somewhat different nature. For much of the length, the river now travels through a wide, flat area which lacks a defined channel or adequate gravel, and then into a series of ponds. Not only is this situation geomorphologically unlikely and unnatural, it provides many barriers to both juvinile and adult salmon survival. The wide, flat, shallow area presents stranding issues during flow fluctuation, as well as avian predation of smolts. During low summer/fall flows, the wide, flat, shallow area provides a passage problem for spawning adults returning to upstream spawning areas (during the September of 1997, CDFG was for forced to dig a temporary channel through part of the proposed project site to facilitate a safer fish passage past the site). The in-stream ponds provide habitat for predatory fish. The ponds to some extent also serve to increase water temperatures, particularly under low flow conditions.

The river now flows through these warm ponds of slow-moving water which are ideal habitat for large and smallmouth bass and other predators of juvenile salmon. A pilot study which investigated predation of juvenile salmon in ponded portions of the Tuolumne River indicated that small and largemouth bass were a legitimate predator of juvenile chinook salmon (EA, September 1990). Based on the study data, which is supported in previous literature (EA, September 1990). Anecdotal information indicates the well accepted knowledge that most instream ponded areas within the Stanislaus, Tuolumne, and Merced Rivers provide excellent bass fishing. From this information, it has been assumed that this same salmon predator relationship exits in all captured mining pits throughout the east-side San Joaquin basin tributaries. The juvenile salmon migrating downstream become disoriented in the slow moving waters of the pond and become extremely vulnerable to predation by bass and other potential predators. Juvenile salmon transiting through these warm water ponds are less likely to survive than those salmon smolts outmigrating in faster moving cool river water. It is also logical to assume that the ponds also serve as a reproduction site, rearing area, and distribution point from which these salmon predators migrate and recharge the river system.

- f. Monitoring and Data Evaluation: To evaluate the project success as well as adapt and maintain the project over the engineered life of the project, it is necessary that a monitoring program be included to address the identified project objectives. Monitoring activities will address the following hypothesis: Question: At similar flows, how much usable largemouth bass, smallmouth bass, squawfish and salmonid habitat exist before and after construction of the Willms Project? Assumption: After project construction, usable largemouth bass, smallmouth bass and squawfish habitat will decrease and usable salmonid habitat will increase. Although a final monitoring program is still in discussions, the preliminary monitoring procedures are described in Table 2.
- g. Implementability: Construction is planned to begin Summer 2000. As previously stated, CDFG and the landowners have been in discussions to repair this section of the Merced River for almost a decade (one of the earlier restoration designs was developed by Trinity Fisheries Consulting, September 1989). The CDWR/CDFG Delta Pumps Fish Protection Program (Four Pumps) has already funded and completed preliminary design efforts for the proposed project site (as well as three additional associated future project sites). These latest designs have been reviewed and approved by the landowner, who will actively participating in the final design efforts. The project will comply with all required Federal and State laws, regulations, and environmental review. The USFWS staff are knowledgeable and approve the proposed project.

Local and environmental support for this project was acknowledged at the CALFED/SJRMP San Joaquin River Fishery Technical Team meeting in January 1997 when the group agreed to include this project in the final report (Project #2). The local landowner and the Merced County Planning Department are supportive and actively participating in the project planning process. Landowner access agreements will be developed prior to any construction. A long-term riparian and grazing easement may be a condition of this ultimate access.

TABLE 2. Salmon predator habitat removal/isolation project monitoring plan..

In order to evaluate project success, the following issues must be addressed during the monitoring program:

Monitoring of Physical River Processes

- A. Reference Site = pre-project condition. Topographic survey of project. Transect taken at places where information can be placed into PHABSIM to determine usable fish (salmonid, bass and squawfish) habitat.
- B. Project Site Specific
 - a. Collection of post project conditions (as-built project).
 - 1) Pebble counts and bulk samples taken on point bars and riffles.
 - 2) Cross sections. Transect taken at places where information can be placed into PHABSIM to determine usable fish (salmonid, bass and squawfish) habitat.
 - 3) Install scour chains on riffles.
 - 4) Gravel permeability
 - b. After first event over 3,000 cfs.
 - 1) Pebble counts on riffles and point bars.
 - 2) Cross sections...integrated into PHABSIM
 - 3) Monitor outside on curves for lateral migration.
 - 4) Reset and evaluate of scour chains/depth of bed movement
 - 5) Gravel permeability
 - c. After first events greater than 7,000 cfs.
 - 1) Pebble counts on riffles and point bars.
 - 2) Topographic survey if it appears there has been a large movement. Cross sections integrated into PHABSIM
 - 3) Monitor outside on curves for lateral migration.
 - 4) Reset and evaluate of scour chains.
 - 5) Gravel permeability
 - d. After 5 years, 10 years and 15 years.
 - 1) Pebble counts and bulk sample analysis.
 - 2) Topographic survey of project. Cross sections integrated into PHABSIM.
 - 3) Reset and evaluate of scour chains.
 - 4) Gravel permeability
 - e. Monitoring report after each monitoring episode. PHABSIM run with measurement collected from physical monitoring.
 - f. If site is modified after one of the above evaluations, monitoring of the newly constructed site will be preformed as above.

Monitoring Relative Abundance of Fishes at Project and Reference Sites

Question: During similar time periods (spring and fall) and similar physical conditions (flow, temperature, moon phase etc.), what are the relative abundance of largemouth bass, smallmouth bass, squawfish and salmon at similar sites before and after the construction of the Project? Assumption: After project construction the relative abundance of salmon at the project site will be greater than it was before project construction because of increased salmon habitat and decreased predator habitat.

- A. Primary Reference Sites = 2 similar site near project. Control site selected because they are future project sites. Information collected becomes baseline data for that future project.
 - a. Pre-project monitoring
 - 1) Snorkeling survey completed at each reference site if possible.
 - 2) Other appropriate sampling techniques if unable to complete snorkeling survey.
 - a) Electro-fishing
 - b) Gill or Fyke nets
 - b. Post-project bi-annually (spring and fall) for 3 years. Repeat pre-monitoring survey.
- B. Project Site

TABLE 2. (continued)

- a. Pre-project monitoring
 - 1) Snorkeling survey completed at each reference site if possible.
 - 2) Other appropriate sampling techniques if unable to complete snorkeling survey.
 - a) Electro-fishing
 - b) Gill or Fyke nets
- b. Post-project bi-annually for 3 years. Repeat pre-monitoring survey.

Monitoring of Revegetation at Project Site.

Question: What amount of disturbed area has been covered by plant growth at the project site over 10 years? Assumption: Vegetation growth will cover 20% of the disturbed area after 3 years, cover 50% after 5 years and 90% after 10 years.

- A. Pre-project
 - a. Photo station documentation of project area.
 - b. Plant survey from environmental document project description
- B. Post-project as-built
 - a. Photo station documentation of project area.
 - b. Standard transect to document vegetation growth.
- C. Annually for 10 years
 - a. Photo station documentation of project area.
 - b. Written monitoring report.
- D. After years 1, 3 and 9.
 - a. Standard transect to document vegetation growth.

Monitoring Relative Abundance of Fishes Basinwide

Question: During similar time periods (spring and fall) and similar physical conditions (flow, temperature, moon phase etc.), what are the relative abundance of largemouth bass, smallmouth bass, squawfish and salmon in the Merced River? Assumption: As salmon habitat improvement projects are completed in the Merced River, the relative abundance of salmon in the river will increase and the relative abundance of predator fish will decrease because of increasing salmon habitat and decreasing predator habitat.

- A. Population abundance of salmon
 - a. Adult salmon. Annual carcass survey.
 - b. Juvenile salmon
 - 1) Annual screw traps survey
 - 2) Annual Mossdale trawl
- B. Population abundance of predator fish species.
 - Bi-annual (spring and fall) sampling at representative sites on the river to determine
 predator populations basinwide. Surveys techniques will be electro-fishing or gill nets.
 - b. Incidental information. Creel census and angler survey. Relate to emigration and immigration rates.

Monitoring Emigration and Immigration Basinwide

Question: During similar time periods (spring and fall) and similar physical conditions (flow, temperature, moon phase etc.), what type of movement is exhibited by largemouth bass, smallmouth bass and squawfish in the Merced River? Assumption: As salmon habitat improvement projects are completed in the Merced River, the movement of predator fish will decrease because habitat preferred by predators will be limited.

- A. Emigration and Immigration rates
 - a. Bi-annual (spring and fall) mark and recapture survey at representative sites to determine predator fish movement.
 - b. Creel census and angular survey to supplement mark and recapture sampling.

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TABLE 2. (continued)

Monitoring Predation Rates Basinwide

<u>Question</u>: During similar time periods (spring and fall) and similar physical conditions (flow, temperature, moon phase etc.), what is the predation rate on salmon by predator fish in the Merced River? <u>Assumption</u>: As salmon habitat improvement projects are completed in the Merced River, the predation rate on salmon will increase because of increased salmon populations and decreased predator populations.

A. Predation rates

a. Bi-annual (spring and summer) lavage survey at representative sites to determine predation rate on salmon fry and smolts.

Positive discussions regarding these issues are currently underway between CDFG and the landowner. California Department of Transportation (CalTrans) has recently expressed a positive interest in the proposed project because past river alignment has negatively impacting the J59 bridge. They have been involved in the preliminary engineering and have expressed an interest in project participating by assisting in developing the environmental documentation. Discussions with CalTrans are currently in progress.

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B. Loudermilk, personal communications. William E. Loudermilk, Senior Biologist Supervisor (Marine/Fisheries), CDFG Region 4, 1234 East Shaw Ave., Fresno, CA.

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V. Cost and Schedule to Implement Proposed Project

a. Budget Costs

Total project cost, including preliminary engineering, pre- and post-monitoring, environmental documentation, construction, revegetation, maintenance, and reporting is estimated to be \$5,677,518 (cost breakdown, Tables 3-4). The Four Pumps Program has already invested over \$40,000 in preliminary engineering of the proposed project site and will contribute <u>at least</u> \$500,000 towards project construction (this proposal is being prepared prior to final committee obligation). It is important to note that there most likely will be some costs associated with obtaining riparian and grazing easements, but these costs will be funded from other funding sources such as Four Pumps. CDWR will manage the project's financial aspects including subcontracts with CDFG for revegetation activities and biological monitoring. CDWR's Division of Engineering will conduct the construction bid process and construction contract management.

CALFED funding is needed to complete the cost-share funding for the project with State and Federal funding listed below. As identified in *section II-d*, the proposed project has been identified as a priority restoration action in several State and Federal salmon restoration plans. The proposed project has been favorably discussed with CVPIA-AFRP staff for 1999 funding consideration.

Secured or expended project funding:

a. CDWR preliminary engineering	\$ 40,000
b. Four Pumps	\$ 500,000
c. DFG Proposition 70	\$ 250,000
Total Committed	\$ 790,000

Requested funding to complete total project:

e. CVPIA AFRP Program	\$2,443,759
g. CALFED Category III	\$ <u>2,443,759</u>
*Restoration Activity Total	\$5,677,518

b. Scheduled Milestones

- Cost-share agreements in-place March 1, 2000
- ► Complete environmental documentation and permits process March 1, 2000
- ► Complete construction cost estimate and bid specifications March 31, 2000
- ► Complete bid process and award contract June 1, 2000
- ► Begin construction June/July 1, 2000 (Construction window is June-September)
- ► Complete construction September 30, 2001
- ➤ Begin revegetation December 1, 2001

c. Third Party Impacts

Third party impacts are not anticipated for this specific project. Yet, as more projects of this type are completed and a major objective of the proposed project is in fact realized (reduce bass predation of juvenile salmon), the recreational bass fishing opportunity on the Merced (and other San Joaquin tributaries) may decline. The proposed project monitoring program will gain insight to the expected predator fish population decline. Once a significant rate of decline is confirmed, measures to address the loss to recreational opportunity will be considered. Currently, the sportfishing opportunities greatly outnumbers any impact generated by this proposed project.

TABLE 3. Projected budget, Merced River Salmon Habitat Enhancement

MERCED RIVER SALMON HABITAT ENHANCEMENT RIVER MILES 42 to 43.5

PRO	JECTED	BUDGET

•	PRI	OR FY'S	FY	98-99	F	Y 99-00	F	Y 00-01	F	Y 01-02	F	Y 02-03 .	TOTAL
PRELIMINARY SURVEY & ENGINEERING	\$	40,000											\$ 40,000
FINAL DESIGN AND ENGINEERING		•			\$	250,000							\$ 250,000
ENVIRONMENTAL DOCUMENTS & PERMITS			\$	50,000	\$	50,000							\$ 100,000
COST/SPECS, BID PROCESS, CONTRACT MGMT					\$	42,900	\$	35,700	\$	21,400			\$ 100,000
CONSTRUCTION					\$	560,205	\$	1,677,259	\$	1,117,054			\$ 3,354,518
CONSTRUCTION MANAGEMENT & SURVEY					\$	55,945	\$	167,500	\$	111,555			\$ 335,000
REVEGETATION & MONITORING (2012)							\$	114,600	\$	343,800	\$	114,600	\$ 573,000
PROJECT EVALUATION & MONITORING	,		\$	20,000	\$	28,080	\$	28,080	\$	64,420	\$	39,420	\$ 180,000
MAINTENANCE									\$	20,000	\$	187,500	\$ 207,500
PROJECT MANAGEMENT (DWR - ESO)			\$	2,650	\$	6,385	\$	6,385	\$	6,385	\$	3,200	\$ 25,000
CONTINGENCY							\$	512,500					\$ 512,500
TOTALS	\$	40,000	\$	72,650	\$	993,515	\$	2,542,024	\$	1,684,614	\$	344,720	\$ 5,677,518

```
TABLE 4. Itemized Project Costs, Merced River Salmon Habitat Enhancement
1. Preliminary Field Survey and Engineering.....
                                                                             40,000
2. Final Design Engineering
   a. Activities required in intermediate steps before final design.
      May include collecting additional data, meeting to discuss
      alternatives or amendments to design, modification of design,
      and analysis.
       Senior Eng. ($680/day)*(50 days)
                                                $34,000
       Associate Eng. ($580/day)*(40 days)
                                                $23,200
       Junior Eng. ($450/day)*(40 days)
                                            = $18,000
       Student ($264/day)*(20 days)
                                            = $ 5,280
       Senior Delineator ($437/day)*(3 days) = $1,311
       Per Diem ($125/day)*(5 days)*(3)
                                            = $ 1,875
    b. Creation of final design after peer review and funding
      requirements are met. Includes data collection, design,
      and coordination meetings.
       Senior Eng. ($680/day)*(40 days)
                                             = $27,200
       Associate Eng. ($580/day)*(80 days)
                                            = $46,400
       Junior Eng. ($450/day)*(110 days)
                                             = $49,500
       Student ($264/day)*(110 days)
                                             = $29,040
       Senior Delineator (\$437/\text{day})*(25 \text{ days}) = \$10,925
       Per Diem ($125/day)*(5 days)*(3)
                                             = $ 1,875
       Supplies
                                             = $ 1.394
                                  Total
                                                                          $ 250,000
3. Permitting and Environmental Documentation (EIR) to be
   funded in cooperation with Caltrans (includes Caltrans contribution)...........$ 100,000
4. Division of Engineering to prepare Project Bid Specifications
   (per State guidelines), advertise, and contract project. This
   5. Project Construction
    Material Costs: (Import material trucking over 9 mos. [180 days])
        round trip (20 miles) - 30 min.
        load and dump time - 45 min.
        truck and driver $60.00/hr.
        unit weight 1.75 ton/yd
        fill material (local gravel company quote) $1.71/ton + tax
        rip rap $9.00/ton + tax
        8"-12" cobble $10/ton + tax
        Fill Unit Costs:
        (1.25 \text{ hrs})*(\$60/\text{hr.})+(\$1.85/\text{ton})*(24 \text{ ton/truck})
               (24 ton/truck)
                                       =$4.98/ton
        (1.75 \text{ ton/yd}^3)*($4.98/\text{ton})
                                            =$8.72/yd<sup>3</sup>
```

Rip Rap Unit Costs:

TABLE 4. (continued)

```
(1.25 hrs)*($60/hr.)+($9.65/ton)*(24 ton/truck)
             (24 ton/truck)
                                      =$12.78/ton
      (1.75 \text{ ton/yd}^3)*(\$12.78/\text{ton})
                                              =$22.37/yd^3
      Cobble Unit Costs:
      (1.25 \text{ hrs})*(\$60/\text{hr})+(\$10.73/\text{ton})*(24 \text{ ton/truck})
              (24 ton/truck)
                                       =$13.86/ton
      (1.75 \text{ ton/yd}^3)*(\$13.86/\text{ton})
                                              =$24.26/yd^3
      Total fill needed: 180,000 yd3
      Total rip rap needed: 600 yd3
      Total cobble needed: 10,060 yd3
      fill cost:
                  (180,000 \text{ yd}^3)*(\$8.72/\text{yd}^3)
                                                           $1,569,600
                    (600 \text{ yd}^3)*(\$22.37/\text{yd}^3)
                                                               13,422
      rip rap cost:
      cobble cost:
                     (10,060 \text{ yd}^3)*(\$24.26/\text{yd}^3)
                                                           $ 244,056
   Equipment costs: (Construction over 6 mos. [120 days])
       2 - D-9 Bulldozers ($16,000/mo)*(9 mos)
                                                           $ 144,000
          Oper ($45/hr)*(8 hrs)*(20 days)*(9 mos)
                                                           $ 64,800
       1 - D-8 Bulldozer ($12,000/mo)*(6 mos)
                                                           $ 72,000
          Oper ($45/hr)*(8 hrs)*(20 days)*(6 mos)
                                                         $ 43,200
       2 - Water Trucks ($4,000/mo)*(9 mos)
                                                           $ 36,000
                                                       = $ 60,480
          Oper ($42/hr)*(8 hrs)*(20 days)*(9 mos)
       2 - Excavators (\$70/hr)*(8 hrs)*(120 days)*(2 exc.) =
                                                          $ 134,400
          Oper ($62/hr)*(8 hrs)*(20 days)*(6 mos)*(2)
                                                       = $ 119,040
       6 - 25 yd dumps ($6.500/mo)*(6 mo)*(6 trucks)
                                                       = $ 234,000
           Oper ($42/hr)*(8 hrs)*(20 days)*(6 mos)*(6)
                                                       = $ 241,920
       3 - 988 Loaders ($12,000/mo)*(6 mo)*(3 loaders)
                                                           $ 216,000
          Oper ($45/hr)*(8 hrs)*(20 days)*(6 mos)*(3)
                                                       = $ 129,600
          Mob and Demob ($2,000/item)*(16 items)
                                                           $ 32,000
                          Total Construction Cost.....
                                                                              $3,354,518
6. Revegetation and Habitat Enhancement:
   Preliminary design work = $ 10,000
   Final design work =
                                 $ 20,000
   Design Implementation =
                             $543,000
                              Total
                                                                              $ 573,000
7. Construction management and construction survey
   180 days of construction
   Senior Eng. ($680/day)*(20 days)*(7 mos)
                                                        = $ 95.200
   Associate Eng. ($580/day)*(20 days)*(9 mos)
                                                        = $ 104,400
   Junior Eng. ($450/day)*(20 days)*(9 mos)
                                                        = $ 81.000
   Per diem ($125/day)*(16 days)*(25 mos)
                                                               50,000
                                                                4.400
   Supplies
                                  Total.....
                                                                              $ 335,000
8. Project Evaluation and Monitoring.....
                                                                              $ 180,000
```

.: .-

TABLE 4. (continued)

 Maintenance for duration of 15 year life of project. to address areas of project concerns and repairs. Constructed and existing berm maintenance: Projected cost per foot = \$25 Total length of berm to be maintained = 4,300 feet (\$25/ft)*(4,300 ft) Other concerns to be identified during project monitoring process. 		\$107,500 \$100,000		
		\$100,000		
Total		***************************************	\$	207,500
10. Project Management (DWR-ESO)	**********	••••••	\$	25,000
11. Contingency (10% of total project cost)		•••••	\$	<u>512,500</u>
Project Cost: Merced River Salmon Habitat Enhance River Miles 42 to 43.5			\$3	5,677,518

Note: Estimates include direct and indirect costs.

TABLE 4. (continued)

 Maintenance for duration of 15 year life of project. Set aside to address areas of project concerns and repairs. Constructed and existing berm maintenance: Projected cost per foot = \$25 	
Total length of berm to be maintained = $4,300$ feet (\$25/ft)*($4,300$ ft) = \$107,500	
Other concerns to be identified during project monitoring process. = \$100,000	
Total	\$ 207,500
10. Project Management (DWR-ESO)	\$ 25,000

River Miles 42 to 43.5.....

\$ 512,500

\$5,677,518

11. Contingency (10% of total project cost).....

Note: Estimates include direct and indirect costs.

Project Cost: Merced River Salmon Habitat Enhancement

VI. APPLICANT QUALIFICATIONS

The CDFG is the legislative mandated "trustee of the State's fish and wildlife resources" and has for several decades been involved with salmon restoration actions within California. Specific to the Central Valley, since the 1986 Delta Fish Protection Agreement (Four Pumps Agreement) between CDFG and CDWR, the Four Pumps program has been instrumental in facilitating several salmon restoration actions within the San Joaquin and Sacramento River tributaries. The Four Pumps Program is unique in that it allow the two agreement parties, CDFG and CDWR, to draw upon the specialized talents and expertise which are available within the two California Resources Departments. During the ten-year existence of the program, the quality of projects and staff capabilities of the program has increased significantly with program experience and stakeholder involvement. Four Pumps restorations actions within the Central Valley continue to remain in the forefront of Central Valley salmon restoration planning efforts. Following are qualifications of the identifed project contacts:

Biology Coordination - Clarence Mayott, Associate Fishery Biologist, CDFG Region 4 (Fresno). Mr. Mayott has managed the San Joaquin Salmon Habitat Crew for three years to facilitate anadromous fish restoration actions within the San Joaquin basin. Under the direction of the Region 4 Anadromous Fish Program Supervisor, Mr. Mayott has been instrumental in the planning and development of all salmon restoration activity within the San Joaquin. Prior to his current position, Mr. Mayott was involved with the California Agriculture Department spray programs in the San Joaquin. This knowledge and his local landowner contact has proved beneficial in the project planning activities.

Engineering Coordination - Kevin Faulkenberry, Associate Engineer (Registered) in CDWR San Joaquin District. Currently Mr. Faulkenberry manages the San Joaquin District's salmon habitat restoration program. While working to manage this program, Mr. Faulkenberry has developed many cooperative relations with local, State and federal agencies that have proven to be instrumental in all phases of project development and implementation. Mr. Faulkenberry has five years of experience in planning, permitting, surveying, design, and construction management of river restoration projects on the San Joaquin River system while working for the Department of Water Resources. Familiar with gravel replacement, predator habitat isolation, floodplain restoration and backwater stabilization, Mr. Faulkenberry has completed numerous successful projects on the Stanislaus, Tuolumne, Merced and San Joaquin Rivers. Mr. Faulkenberry also has training in developing hydraulic models for HEC-2, flow-frequency and sediment-transport analysis.

Project Development Coordination - Fred Jurick, Associate Fishery Biologist (M.S. Natural Resource Management) in CDFG Inland Fisheries Division. Mr. Jurick has been the DFG Four Pumps Salmon Coordinator since 1993 and responsible for coordinating with the CDFG/CDWR field staff to develop and facilitate salmon restoration projects. These activities have included (but not limited to) coordination of project planning efforts, preparing project proposals, secure funding approval, prepare environmental documentation, acquire project permits, and coordinate environmental compliance activities. Prior to his role as CDFG Four Pumps Salmon Coordinator, Mr. Jurick was involved for several years in fishery development work on the California North Coast which included salmon restoration actions as well as international fishery development.

Financial Coordination - Stephani Spaar is an ES IV (M.S. Fisheries Biology) in DWR's Environmental Services Office has been with DWR since 1987. Four Pumps Program staff biologist 1988-1990, leadperson for various Interagency Ecological Program estuarine fisheries studies 1987-1994. Current position with the Four Pumps Program (1994- present) involves project management and coordination of various aspects of implementation for over numerous current fish mitigation projects. Responsibilities include preparation and management of contracts (up to \$2.5 million/contract) and budgets (up to \$27 million for one project), coordination with non-Four Pumps funding on cost-share projects, project tracking and scheduling, and close coordination with CDFG and other DWR divisions on permitting, engineering, and other aspects of project implementation.

ATTACHMENT 2

Preliminary Design Report for the Robinson Phase

February 15, 2000

Merced River, Robinson/Gallo Project Preliminary Design Report for the Robinson Phase

California Dept. of Water Resources

San Joaquin District

February 15, 2000

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Introduction	2
Project Description	3
Goals and Objectives	4
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Design Schedule ·	- 5
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Introduction

The Merced River has undergone extensive modification over the years to provide agricultural and municipal water supply, flood control, and power generation, as well as raw materials such as gravel products and gold. As early as the 1870's, large canal systems were built to divert Merced River water for agricultural uses. Several dams were built to regulate flows, the largest being New Exchequer Dam (completed in 1967) which can store up to 1,032,000 acre-feet of water in its reservoir. Mining for gold and aggregate downstream of the dams has been extensive, leaving tailings and numerous pits within the river corridor.

The manipulation of the river and its resources has led to loss and degradation of native habitat. There have been several impacts to salmon in particular. With the building of dams, access to spawning grounds upstream has been lost, and gravel recruitment is greatly reduced in reaches below the dams. The large in-stream ponds left by mining create habitat for introduced predator fish species which prey upon juvenile salmon.

A loss of gravel recruitment to the lower reaches of the river can also be attributed to dams. The river is "sediment starved" and tends to recruit sediment from channel banks and beds during higher flows. Over time this results in channel degradation, which when combined with reduced flow can further narrow the channel and lead to abandoned flood plains. Prior to the January 1997 flood event, the reach of Merced River between the Highway 59 bridge and Snelling (within which this project falls) had shown little evidence of degradation, although reaches both upstream and downstream of it appeared to be degrading (J. Vick, *Habitat Rehabilitation in the Lower Merced River*, 1995). During the 1997 event the mining berms which had confined the river to a historic channel in the project reach (RM 42 to 43.5) were breached, and as a result the river abandoned its channel in favor of a gravel pit with an invert approximately six feet below the channel's. Historically as much as 25 percent of spawning took place on this reach of the river (Comm. Bill Loudermilk, DFG), and the abandonment of the channel resulted in the loss of several salmon spawning riffles and much of the existing nursery habitat.

The original problem in the project reach consisted of a narrow channel confined by berms with in-stream ponds and no flood plain. This was a result of mining the gravel on either side of the channel to below the channel invert elevation. The earliest of these pits were created to provide gravel for the construction of Exchequer Dam and roads leading to Yosemite National Park (Comm. Chris Robinson, 12/7/99). With the 1997 flood event came several major changes to the reach and to the nature of the problem. For much of the length, the river now travels through a wide, flat area and then into a series of ponds (see Appendix A). The flat area lacks a defined channel or adequate gravel in the bed, which are important elements in any functional stream. Not only is this situation geomorphically unlikely and unnatural, it provides many barriers to salmon survival. The wide, flat, shallow area presents stranding issues during flow fluctuation, as well as avian predation of smolts, and the in-stream ponds provide

habitat for predatory fish. The ponds to some extent also serve to increase water temperatures, particularly under low flow conditions. This affects migrating adults and smolts.

Project Description

The proposed project is on the Merced River between river miles 42 and 44, just upstream of the Highway 59 bridge. It consists of two of the five reaches of the Robinson Ranch Salmon Habitat Enhancement Project, which was approved for funding under the Four Pumps Agreement in July, 1998, and CALFED in 1998. The two reaches are described in Land and Reclamation Permits #597 and #307. It consists of a wide, flat, shallow upstream reach and several in-stream ponds in the downstream reach. The current alignment bypasses much of the original channel, and therefore, much of the coarse sediment and existing spawning and rearing habitat. The project will also include a 2,000 foot section of the river immediately upstream of the flat upper section. This reach consists of a narrow incised channel running alongside an abandoned point bar. The point bar will be excavated to flood plain elevations and the channel reconfigured in this reach. Excavated material will be used as fill for the project.

The objectives of the project include removing predator habitat and producing and improving habitat for salmon. The predator habitat will be eliminated by both filling and

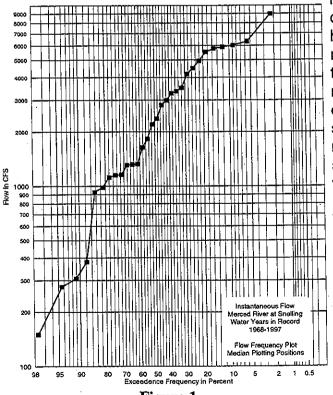


Figure 1

isolating ponds from the channel. In order to improve spawning and rearing habitat for salmon, the channel will be reconfigured. This will include scaling the channel to fit the post-dam flow regime. Over the entire reach, the channel will be designed to include spawning riffles, runs, and pools, with a meander which fits the approximate slope and bankfull flow of 1,700 cfs. It will also include flood plains which will be replanted with native riparian vegetation. The upstream section (upper portion of Permit #597 reach) will consist of the constructed channel, flood plains, and high terraces (inundated at 100 year event, 12,000 cfs). The downstream reach (Permit # 307 and lower portion of Permit #597) will not include terraces, but will use berms to isolate two pond areas. The berms will be constructed to exclude a flow of at least 8,000 cfs (approx. 30

year event, see Figure 1) plus freeboard, and will include "equalization saddles" and bank protection to minimize damage during high flows.

Goals and Objectives

- 1. Eliminate or isolate juvenile salmon predator habitat.
- 2. Increase the quantity and quality of spawning habitat for chinook salmon.
- 3. Increase the quantity and quality of rearing habitat for chinook salmon.
- 4. Improve river and flood plain dynamics by reconfiguring the channel to better conform with the present flow regime.
- 5. Create and enhance the riparian corridor.
- 6. Improve sustainability of the river.
- 7. Improve the adult and juvenile migratory path.

Project Specifics/Parameters

Two types of parameters were identified for the project. The first type, Project Parameters, pertain to attributes which apply to the entire project. The second, Channel Parameters, are attributes of the design channel specifically.

Project Parameters:

Valley Length: 1.8 miles

Area: 264 acres

Pond Area Removed: 45 acres Pond Area Isolated: 10 acres

High Terrace Area Created: 28 acres Length of berm created: 2,900 ft

There will be a sediment balance within the reach (sediment in = sediment out) even though the design channel will be capable of conveying the D_{84} particle at bankfull flows. This will be achieved by including coarse sediment infusion sites along the project length. The D_{84} particle will be mobile during a 1.5 to 2.0 year event, and flood plains will be regularly inundated.

Channel Parameters:

Length: 10,400 ft Low Flow: 225 cfs

Low Flow Depths: 2 ft (riffles) to 4 ft (pools)

Average Low Flow Width: 50 ft

Bankfull Flow: 1,700 cfs

Bankfull Depths: 5 ft (riffles) to 7 ft (pools)

Average Bankfull Width: 120 ft

Bankfull Average Velocity: 4.5 ft/s (riffles) to 3.2 ft/s (pools)

Flood Flow (minimum): 8,000 cfs

Flood Flow Depths: maximum of 10.2 ft (riffles) to 12.1 ft (pools) Flood Flow Average Velocities: 4.7 ft/s (riffles) to 4.3 ft/s (pools)

Flood Plain Width: 400 (bridge) to 1,100 ft Meander Wavelength: 1,100 to 1,700 ft

Total area suitable for spawning to be constructed (as per <u>California</u> <u>Salmonid Stream Habitat Restoration Manual 1994)</u>: 21,900 yd²

Although there is on-site material which is suitable for use in the constructed channel, site surveys show that a large portion of the proposed alignment will pass through areas which have been mined of gravel resources, leaving mostly clays. Approximately 2,800 feet of the proposed channel will require extensive manipulation and replacement of substrate in order to provide an adequate and stable base for spawning riffles, runs, and pools.

Design Schedule

The schedule for design of the project is shown in Figure 2:

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Figure 2

Note the two periods for review of the design scheduled. The overall plan for design is divided into three distinct tasks, the first of which is the preliminary design. The preliminary design illustrates the general plan for the project. This task culminated in the production of this report. At the end of the preliminary design period there will be a period of review as shown. Comments from the review period will be considered and will be implemented in the final design when appropriate. The second main task will be the mapping of the project area, which includes surveys and topo map generation. The final task will be production of the final design, with a review period in June, 2000. The review periods are necessarily short in order to assure adequate time to implement any changes needed.

The timeline for construction of this project will include two full summer seasons. Construction will begin in May of 2001 and it will most likely run through September, 2001. Construction will be resumed in May of 2002, and be completed by the end of September, 2002.

Current Experiments

Sediment Transport Study:

DWR is currently monitoring an upper reach of the project site to determine bed mobility. Three cross-sections (see Figure 3) have been surveyed and pebble counts have been completed for them.

The bed mobility study of the reach is being created to assist engineers in determining the hydraulic conditions which cause incipient motion of the bed surface. The information is being used to determine the flow at which the current D_{84} of the channel is mobilized, as well as the mobile D_{84} necessary for the design bank full flow. Both are being implemented at each section as tracer gravel. These activities will assist in the evaluation of the sediment transport model of the reach. The model is based on Andrews' relationship for the critical shear stress (Shields) parameter for a particle in a stream bed, as illustrated in *Water Resources Research* 30: p. 2247, 1994. Using pebble count results, the Andrews model gives a value for the Shields parameter required for movement of the D_{84} particle. When this parameter is used in the Shields Equation, the τ_{84} , or force required to move the D_{84} particle can be determined. Using this value in the equation $\tau = \rho gRS$ results in a value for R, given a known slope. With R known, the flow required to move the D_{84} particle can be determined by applying it to the surveyed cross-section. Conversely, the D_{84} needed in the channel that corresponds to a given flow can be found by reversing the process.

Hydraulic Parameters:

In the same reach as above, calculations will be done to determine hydraulic

parameters such as Manning's "n". Using observed geometry and conditions of the channel these values can be determined. The results of these calculations will also assist in the calibration of our transport model.



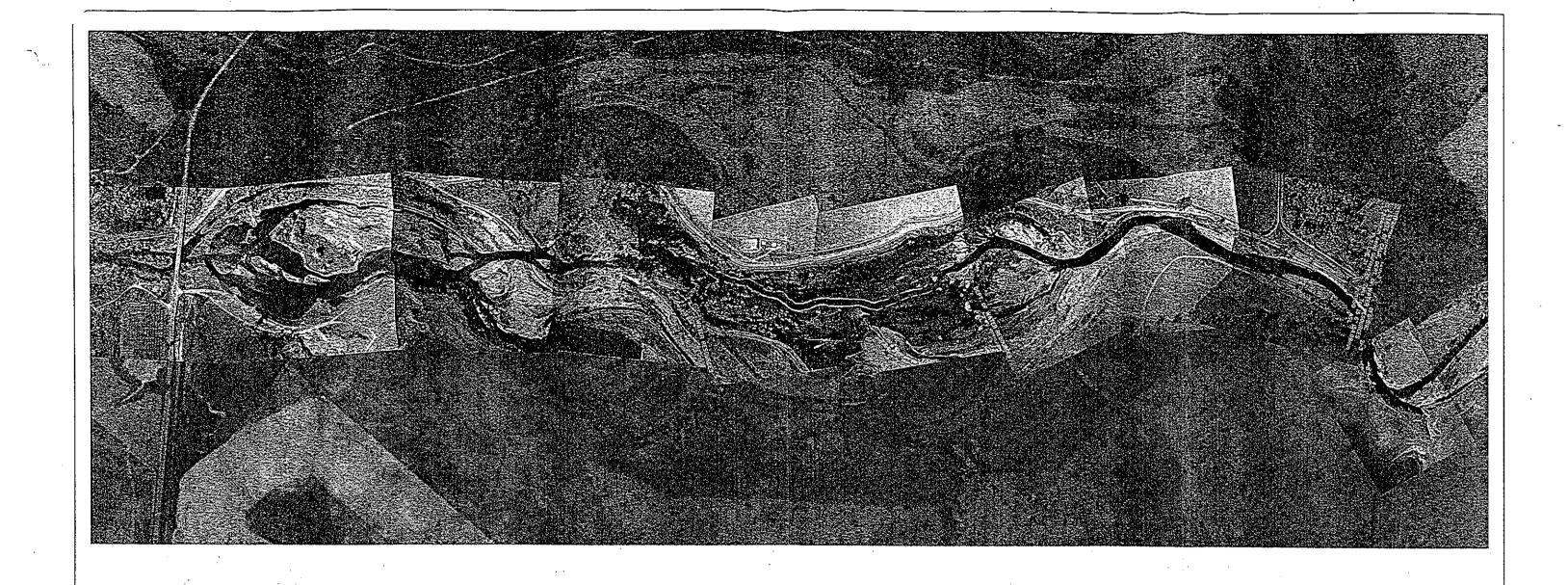
Figure 3

Conclusion

The removal of the ponds from the main channel will garner several benefits. By filling them, the warmwater salmon predator habitat will be removed, and river function will be improved. It will also improve the migratory pathway and rearing and spawning habitat for salmon, and enhance the riparian corridor and river flood plain. The existing active river channel will be reconfigured to take better advantage of the existing flow regime and restore the ability of the river to remove fine material, recruit spawning gravel, and reduce degradation of the channel. In addition, the creation of functional flood plains will increase the stability of the channel throughout this reach. The final stages of the project include the revegetation of the flood plains and terraces to create a riparian

corridor. Gravel infusion sites will be utilized to add coarse sediment to the reach as needed after high flood events.

Appendix A



ROBINSON REACH

Approved by

Design and Engineering by
River Management Section
Drawn by
B. Willems

ATTACHMENT 3

Fisheries Monitoring Plan Ratzaff Project Site

Biological/Fisheries Monitoring Plan/Quality Assurance Program Modifications

Objective 1 of this project is to improve the survival of out-migrating, fall-run chinook salmon smolts.

Hypothesis 1: Following restoration of physical habitat conditions physical conditions (temperatures, flows etc.) at the project site, more salmon smolts will survive through the project site after the project is completed.

Hypothesis 2: water velocity, depths and temperature conditions will become more favorable for anadromous and resident salmonids.

Monitoring/Data collection: During the spring 1999 out-migration season, 3 repetitions of the following procedure were completed, five thousand (5,000) "MadaJet" marked salmon smolts were released above the project site. Catch at two Merced Irrigation District rotary screw traps (RSTs), operated in tandem approximately 7 miles downstream of the release site, was monitored for the recapture of these marked fish (figure 1). Appropriate statistical methods (Ricker, W.E. 1945, 1958 and 1975) will be used to estimate survival and biologists have completed preliminary survival studies that could also be used to as pre-project data. The results of this monitoring provides project personnel an estimate of trapping efficiency and an estimate of the number of marked fish needed to provide statistically valid results for tests conducted in the following three years.

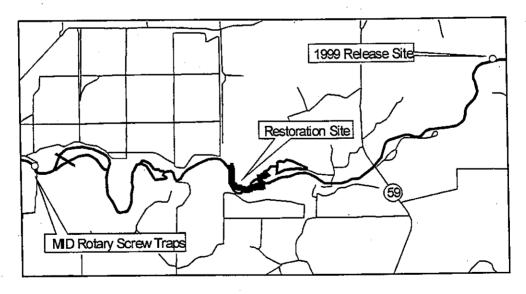


Figure1

1999 Releases

During the spring 2000-2002 out-migrant seasons, 3 specific reaches will be tested three times to evaluate survival of chinook salmon smolts. The reaches will incorporate both restored and unrestored reaches for comparison. Evaluated reaches will include the

Merced River Hatchery to Snelling (A), Snelling to above Hwy 59 (B), and above Hwy 59 to the RSTs (C) (figure 2).

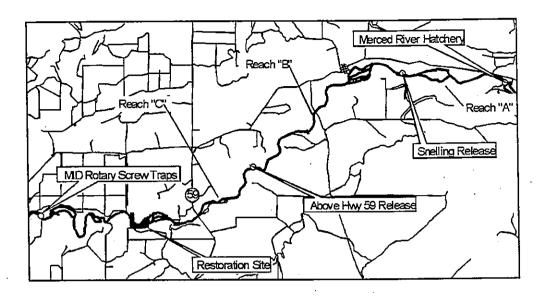


Figure 2

2000-2002 Reach Evaluation

Evaluation will be conducted by releasing fish above each specific reach to be captured at the RSTs. Survival rates from each release site will appropriately be analyzed to establish an estimate of survival along each reach. Releases will be conducted according to table 1.

r	elease numbers are per release
Release, Reach A -	100,000 coded wire tagged fish released from 2 releases @ Merced River Hatchery. (These fish are part of a larger San Joaquin Basin and recoveries at the RSTs will be utilized for project monitoring).
Release, Reach B -	5,000 MadaJet marked fish released from Snelling. 3 releases
Release, Reach C -	3,000 MadaJet marked fish released from above Hwy 3 releases 59.
Efficiency release -	2,000 MadaJet marked fish released for efficiency 3 releases testing of the RSTs.

Table 1, Release Details

This study will utilize the available fish in order to perform three tests that evaluate the treatment reach and two control reaches. Each of the three tests will evaluate a different streamflow/water temperature condition. Release numbers increase with distance from the traps to maximize statistically measurable recoveries.

This testing process is similar to other reach-specific testing occurring in the San Joaquin Basin and is performed in conjunction with basin-wide survival evaluations. Survival and migration rates will be determined using a variety of techniques including the use of Program MARK software (Burnham K.P. and White G.C., 1997). These values will be compared to pre-project survival rates and rates among restored and unrestored reaches. A statistician will be engaged in the final design and evaluation of this program.

Physical characteristics of the specific reaches will be incorporated into analyses utilizing a portable Hydrolab®. This will record temperature and basic water quality at suitable locations within the study reaches. Data will be collected monthly and will augment the survival estimates for comparison of each reach.

Objective 2 is to improve and increase salmonid spawning and rearing habitat.

Hypothesis 1: The ratio of downstream temperature to upstream temperature will decrease after the project is completed.

Monitoring/Data collection: "Onset" temperature recorders will be placed in the Merced River at several appropriate locations above and below the project site before project construction. Temperature recorders will also be placed in the pond that will be isolated after the project is completed. Temperature recorders will be downloaded every 4 months and a temperature profile of this reach will be developed. Temperature recorders will remain in place for 4 years. Pre and post-project data will be compared and analyzed. Analyses will use an accepted temperature model to incorporate temperature profiles into salmonid habitat preferences. Physical cross sectional data, collected for geomorphic evaluation, will also be used to document changes is fish habitat.

Hypothesis 2: Spawning activity (number of redds and live fish) will increase within the project reach.

Monitoring/Data collection: Monitoring of the annual fall-run chinook salmon escapement is currently an objective of DFG's San Joaquin Southern Sierra Region personnel. DFG annually estimates and monitors the adult chinook salmon escapement in the Merced River. Data currently gathered includes:

- 1) A mark/recapture study to estimate population size, record fish lengths and determine sex.
- 2) Estimation of the number and temporal distribution of redds per riffle. These escapement surveys would continue and this data will be utilized to evaluate the

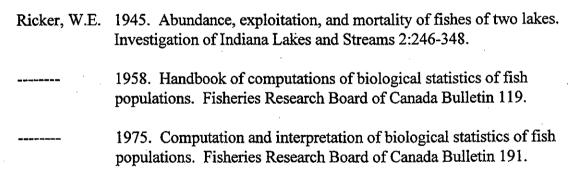
biological changes associated with the project construction.

Coordination and integration: DFG, in conjunction with MID and other stakeholders, are developing a river-wide fishery monitoring plan. At this time rotary screw trapping takes place at 2 locations on the Merced River. Smolt survival studies using coded wire tags (cwt) and "MadaJet" marked fish have been established. Annual salmon escapement surveys have documented populations since 1953.

The monitoring at the Ratzlaff site has been designed to compliment existing river-wide monitoring programs. It will also give biologists a chance to develop new methods and techniques (tagging, Program MARK analyses and numerical maximum likelihood statistics) for evaluation of salmon smolt survival, migration rates, and probability of individual capture. Also, the Ratzlaff site is the first of a series of projects that will reconstruct 3 contiguous miles of the Merced River near Highway 59. As each subproject is constructed, continued and additional monitoring of this 3 mile reach is planned. The monitoring proposed here will "dovetail" into the future monitoring plan for this reach providing a truer evaluation of project success or failure and eventually salmon productivity. Major and minor equipment purchased for this project will be utilized during monitoring of future projects in this and other reaches.

References

Burnham, K.P. and G.C. White, 1997. Program MARK - survival estimation from populations of marked animals. http://www.cnr.colostate.edu/~gwhite/software.html. Fort Collins, Colorado 80523



ATTACHMENT 4

Physical Monitoring Plan Ratzlaff and Robinson Project Sites

Revised Phase 2: Merced River Salmon Habitat Enhancement River Miles 42 to 44 (Robinson Ranch and Permit #307 Sites) Physical Monitoring Plan

Hypothesis	Monitoring Parameter	Data Evaluation	Study Priority and Status
Collection of post project conditions.	a. As-built cross sections and profile. b. Pebble counts. (riffles and point bar apexes) c. Bulk samples. (one per riffle and point bar)	Use baseline conditions to compare to data collected later.	High
2. Hydraulic assumptions are correct. a. n values are correct.(0.027032) b. flood-plain is inundated at flows greater than the design bankfull.	a. water line staking at predetermined flows. b. water surface elevation and slope will be measured at the following flows: > 1,700cfs > 5,000cfs	Use data to evaluate values roughness and evaluate inundation of floodplain.	High
3. The substrate is mobile at or above flows of 1,700 cfs (design bankfull).	a. Place tracer gravel (one riffle, top and bottom sections) b. Evaluate and reset tracer gravel at flows 1,700cfs	Utilize tracer gravel to indicate bed movement and initiate data collection. Compare data with baseline conditions.	High

Revised Phase 2: Merced River Salmon Habitat Enhancement River Miles 42 to 44 (Robinson Ranch and Permit #307 Sites) Physical Monitoring Plan

High	High	High
After winter releases have passed and tracer rock indicated bed movement. Cross-sections, profiles and pebble counts of the riffles and point bars will be performed to evaluate the quantity and quality of gravel transported. This will be used in adaptive management to determine the quantity and gradation of replenishment gravel.	Check project for stability after flows at or near the Reclamation Board design flow have been reached. Compare data with baseline conditions.	Use topographic surveys will indicate plan form changes from the original design parameters. Compare all data with baseline data and analyze for plan form changes.
a. Evaluate and reset tracer gravel. b. Cross sections and profile(sections are at riffles and apex of point bars only). c. Pebble counts. To be evaluated in the spring after flows greater than 1,700cfs have occurred and tracer rock has moved.	a. Cross sections and profile.b. Pebble counts.c. Bulk samples.d. Evaluate and reset tracer gravel.	a. Topographic survey of project. b. Pebble counts. c. Bulk samples. d. Reset tracer gravel. These will occur when there are no flows exceeding 5,000cfs or above within the 5, 10 and 15 year milestones.
4. Bed will be mobilized each winter with unknown frequency and gradation.	5. The project will have some migration/planform adjustment as a result of a flow 5,000 cfs and above.	6. There are planform changes if any after 5, 10, and 15 years.

Talifectills Venoti-Topinzulv (tallo-jioka) sigikan jikagi Jakan jika

California Department of Water Resources San Joaquin District: River Management Section This was done because of concerns for an agricultural pump near station 1+00 on the left bank. Future phases of the project will address and resolve issues related to this pump. Next, two elderberry bushes were discovered shortly prior to construction on the existing berm at approximately station 23+00 to 25+00 of the project. The original design called for this section of berm to be removed, but since the plants had not been included in the mitigation plan the design channel was rerouted to avoid them. As a result, the channel was moved from 5 feet to 15 feet to the right (facing downstream) at stations 21+00 to 27+00, and a mound was left with the bushes that is approximately three feet higher than the design flood plain.

Another modification to the original plan was a small berm that was added to separate most of the backwater area from the main channel. The berm's crown is at flood plain elevation and was added to address sediment transportability concerns as expressed by Jennifer Vick of Stillwater Ecosystem, Watershed and Riverine Sciences. The final modification to the plan was to the bank protection. The original plan called for bank protection on the berm from station 14+00 to 17+00, and on the right bank from station 28+50 to 31+00. The bank protection on the berm was reduced by about fifty percent and the protection at the end of the project was extended by approximately 200 feet. For further information see Appendix D, the construction report prepared by DWR's Division of Engineering.

Prior to bidding, the Department estimated the project would cost approximately \$3.7 million to construct. This included purchase of all imported material and placement. The final cost of construction was \$3.36 million, which leaves approximately \$340,000 of the funded amount for maintenance of the project. The project was constructed under budget even though it required a significantly larger amount of fill material than originally estimated.

Geomorphic Monitoring

Monitoring of this project will be for both morphological and biological processes. The morphological components of the project will be monitored by the Department of Water Resources, and are outlined here. Biological monitoring will be done by the Department of Fish and Game, and will not be discussed here.

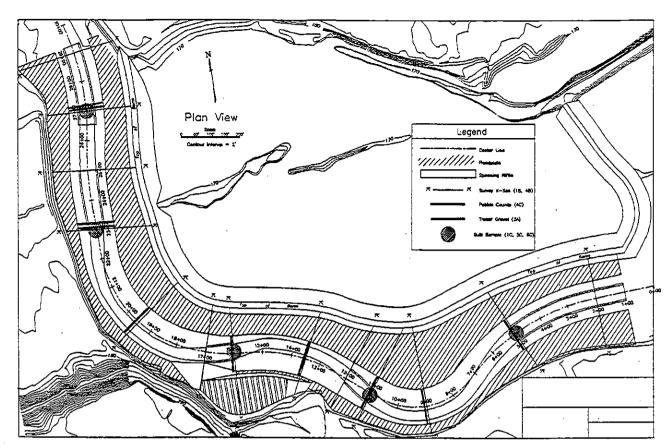


Figure 10 - Monitoring Plan

DWR's monitoring of the project includes several cross-sections at which tracer gravel experiments and pebble counts will be located (Figures 10, 11). These sections and the thalweg profile were surveyed immediately after construction (see as-built drawings, Appendix A). The sections and profile will be surveyed once annually if a flow of greater than 2,000 cfs has occurred, or movement of tracer gravel has been observed. If three consecutive years have not yielded these conditions, a survey of the sections will be completed. The flow of 2,000 cfs was chosen because it is slightly above bankfull, and calculations show that at least 50 percent of the material is mobile at that point. Cross-sections and profiles will be used to document any changes in the storage of alluvium. In addition to the section surveys, a coincident pebble count along with bulk samples will be taken to document any changes in substrate and gravel quality. Thirteen cross-sections will be regularly surveyed - among which eight are designated for the pebble counts and bulk samples. In the baseline monitoring immediately after construction, the pebble counts were completed for all eight sections and bulk samples at five stations. It was determined that in light of the data gathered it was not necessary to take bulk samples on the point bars. This data as well as future monitoring data will be included in a

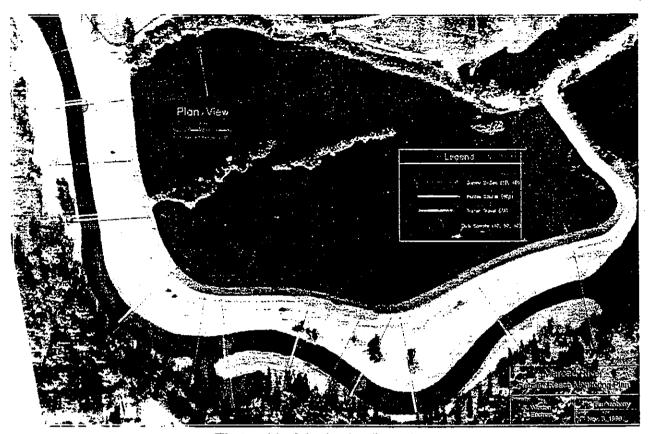


Figure 11 - Monitoring Locations

One area of concern that is being monitored carefully is the "Backwater" area between stations 14+00 and 17+00. This was an area of concern expressed by reviewers of the project plan and will be watched closely using the three monitoring cross-sections at that location.

These monitoring actions, and others to be determined as the project progresses, will allow engineers to assess the effectiveness of the design with respect to the project goals. They will also provide information which will assist in determining volume and location of gravel replenishment projects for the reach in the future.

Conclusion

This project was designed using contemporary methods and techniques, and the goals as outlined in this paper were achieved. The project isolates the predator habitat by separating

ATTACHMENT 5

Project Schedule and Scopes of Work

MERCED RIVER SALMON HABITAT ENHANCEMENT ROBINSON & PERMIT #307 REACH

CVPIA - AFRP (USFWS to DWR)	DEG PROPOSITION 70 (Env. D&E)	CALFED - CAT, III* (USFWS TO DWR)	CONTRACTS:		7.2 GEOMORPHIC ADJUSTMENTS	7.1 GEOMORPHIC MONITORING & EVAL.	7. GEOMORPHIC MUNITURING, EVAL, & AUG S		6. FISHERIES MONITORING & EVALUATION	TO TO THE PART OF	5.2 REVEGETATION MUNITURING & EVAC.	5.1 REVEGETATION/HABITAT GIVEN CEMENT	5. REVEGE A HONHABITAT CHITANCEMENT	THE THE PROPERTY OF THE PROPER	4,3 CONSTRUCTION	#,Z CONSTRUCTION	A CONSTOLICTION MANAGEMENT & SURVEY	A 1 CONTINUE BID CONTRACT MGMT	A CONSTRUCTION.		3.2 FINAL DESIGN ENGINEERING	3.1 PRELIMINARY SURVEY AND ENGINEERING	3. DESIGN ENGINEERING		2 ENVIRONMENTAL DOCUMENTS & PERMITS		1 PROJECT MANAGEMENT - DWR*	TASK		PROJECT SCHEDULE
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NOTE: PROJECT MONITORING - CONTINGENT ON FINAL PLANS TO BE APPROVED BY FUNDING AGENCIES.

1 - PRE-PROJECT MONITORING - Fisheries
2 - POST PROJECT MONITORING: -Revegetation: Post-Construction (5 years (summers) in accordance with ACOE permit)
- Fisheries: Spring & Fall for 2 years

+++ ACTIVITY AS NEEDED or POSSIBLE

- Geomorphic: 1st fall (post-construction), 1700+ event(s), 5000+ event(s), & after 5, 10, 15 years QUARTERLY REPORTS to CALFED and AFRP.

ASSUME: 3-YEAR FUNDING CONTRACTS.

MERCED RIVER SALMON HABITAT ENHANCEMENT ROBINSON & PERMIT #307 REACH

CONSTRUCTION	BID	4. FINAL ENGINEERING	SMARA	RWQCB - WATER	DFG - 1601	RECLAMANTION BOARD	COUNTY	USACE	3. PERMITS		NEPA	CEGA	CEOA	a POCIMENT	CULTURAL RESOURCES	WETLAND	PLANTS	REPILE	MAMMAI	BIRD	1. SURVEYS	TASK		Environmental Documentation and Fernitary Congression	
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ALL APPROVALS IN HAND BY MARCH 2001

ATTACHMENT 6

Landowner Approval Memo

ROBINSON CATTLE COMPANY

May 8, 2000

Christopher Robinson
General Partner

P.O. BOX 10 • MERCED, CALIFORNIA 95341-0010 OFFICE (209) 722-2502 FAX (209) 722-2261

Dear CALFED,

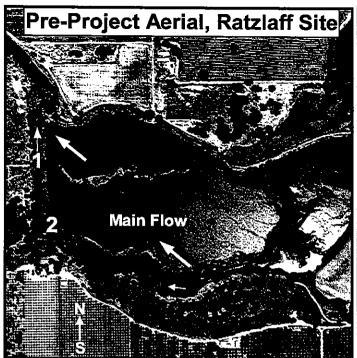
This is to inform the CALFED Bay-Delta Program and other concerned cooperating agencies that I am the sole property owner of the parcels of land which encompass the proposed restoration project, "Revised Phase 3: Merced River Salmon Habitat Enhancement Project – River Mile 42 to 44 (Robinson Ranch site). I am actively involved with both the California Department of Fish and Game and the California Department of Water Resources planning staff for the proposed project as it is currently proposed and intend to provide access to my property to complete design activities, construct and maintain the project. I approve of this project and if there are any questions plase feel free to contact me at 209-722-2261.

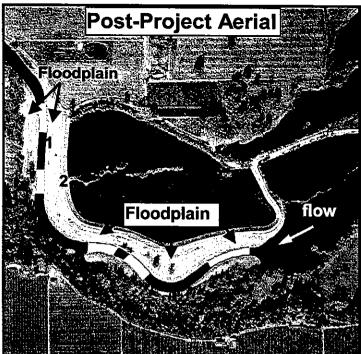
Sincerely,

Christopher Robinson

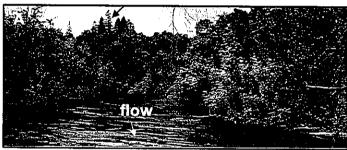
ATTACHMENT 7

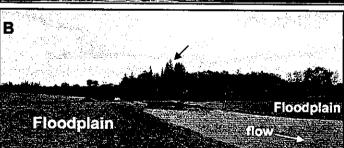
Pictures of Ratzlaff Project Site

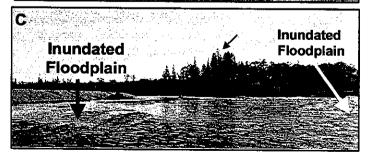




Spawning Riffles

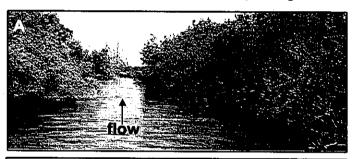


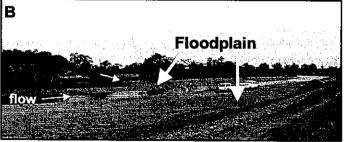


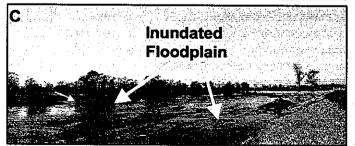


Location 1

Looking upstream from downstream end of the project. (A) Prior to construction during spring flow of 1,900 cfs. Channel is narrow, 20-30 ft. wide, armored with encroaching vegetation with most of the flow diverted through the pond. (B) After construction during fall flow of 200 cfs and channel width of 50 ft. Engineered berm separating floodplain from the pond is to the left. Note location of trees indicated by arrows. (C) Same location during winter flood flow of 3,000 cfs. Floodplain 280 feet wide is inundated.







Location 2

Looking towards the downstream end of the project. (A) Prior to construction during spring flow of 1,900 cfs. Rip rap armoring the bend can be seen at the end of the narrow channel (width 20-30 ft.). (B) After construction during fall flow of 200 cfs. Previous channel was to the left of vegetation marked by arrow. Current channel width is 50 ft. (C) During winter flood flow of 3,000 cfs, inundated channel width, 280 ft. Note water is now flowing around island of vegetation in what used to be the old channel (arrow).

ATTACHMENT 8

Explanation of Estimated Cost Increase for the Robinson Salmon Habitat Project

TO: Delta Pumping Plant	DATE: March 7, 2000
Fish Advisory Committee	SUBJECT: Explanation of Estimated Cost Increase for the Robinson
FROM: Kevin Faulkenberry River Management Section	Salmon Habitat Project

Project costs for the Robinson Reach Salmon Habitat Restoration Project, Merced River, have increased from \$5.7 million under the cost estimate for the May 1998 CALFED proposal to about \$7.9 million currently (see revised budget attached). The increase is due to several factors, including increased material cost, construction and staff time, and monitoring and maintenance costs. Following is an itemized breakdown of estimated increased costs for the Robinson Reach of the Robinson/Gallo Restoration Project:

1. Project Management

\$25,000 to \$50,000 = **\$25,000** increase

The new value is based on past experience on the Ratzlaff project and the larger size and complexity of this project.

- 2. Environmental Documentation No change
- 3. Design Engineering No change
- 4.1 Project Specifications, Bid, Advertise, and Contract Project Division of Engineering

100,000 to 350,000 = 250,000 increase

The Division was not contacted for the original estimate. The new value is based on past experience on Ratzlaff construction and previous costs. In addition, the estimated construction time has been increased from 7 to 9 months.

4.2 Construction Management and Construction Survey

\$335,000 to \$360,000 = **\$25,000** increase

Based on the previous construction of the Ratzlaff Reach, time for supervision was increased as well as supplies necessary to complete the job. The increase in estimated time for construction also affects this figure.

The Delta Pumping Plant Fish Advisory Committee March 7, 2000 Page Two

4.3 Project Construction

\$3,354,518 to \$4,503,410 = \$1,148,892 increase - Materials & Equipment

Materials costs:

\$1,827,078 to \$2,432,730 = **\$605,652** increase

Fill Cost:

\$1.85/ton increased to \$3.77/ton; change = \$1.92/ton

(\$1.92/ton)*(180,000cu.yds)*(1.75ton/yd) = \$604,800 increase

The increase in materials costs is mainly due to market value changes in fill material costs. There is an increase in demand for the previously low-value dredge tailings as a result of current restoration on the San Joaquin System and a resultant increase in their value.

Equipment costs:

\$1,527,440 to \$2,070,680 = \$543,240 increase

The increase in equipment costs is due primarily to omissions in the original calculations and the increase in the estimated construction time from 6 to 9 months.

5. Revegetation, Habitat Enhancement, and Reporting - No change

6. Fisheries Monitoring and Evaluation

\$100,000 to \$276,000 = **\$176,000** increase

DFG has changed their study methodology since the initial estimate based on the Ratzlaff fisheries work and current monitoring for similar projects on other San Joaquin tributaries, with a resulting increase in tagging costs. DFG is also no longer able to absorb the total monitoring costs as in-kind services for reach specific survival work (per.com. Bill Loudermilk). DFG will continue to provide some in-kind services, including the annual spawning surveys.

7.1 Geomorphic Monitoring, Evaluation, and Adjustments

\$80,000 to \$150,000 = **\$70,000** increase

Past experience on the Ratzlaff phase helped to clarify and define monitoring needs on this site.

The Delta Pumping Plant Fish Advisory Committee March 7, 2000 Page Three

7.2 Geomorphic Adjustments

\$207,500 to \$507,500 = **\$300,000** increase

Change is due to an increase in the estimated amount of gravel augmentation necessary to maintain the project.

Contingency

\$512,500 to \$715,991 = \$203,491 increase

The increase in contingency is directly related to the increases above. Contingency is 10% of project costs. The reasons for the higher contingency cost are higher materials costs, higher equipment costs and omissions in the original equipment estimate, and an increase in the estimated construction time from 6 to 9 months.

Total Cost Increase

\$5,677,518 to \$7,875,901 = **\$2,198,383**

Project Cost Estimate

Robinson/Gallo Project Phase II November, 8 1999

1.	Projec	ct Management – DWR	Total	\$50,000
	(estim	onmental Documents. CEQA and permits to be fu ate includes Caltrans contribution). n Engineering	nded in cooper Total	ration with Caltrans \$100,000
0.	3.1. F	Preliminary Survey and Engineering Final Design Engineering	*****	\$40,000
	J.Z. 1	a. Activities required in intermediate steps befo	re final design.	
		May include collecting additional data, meeti	ng to discuss a	Iternatives or
		amendments to design, modification of design	n, and analysis	S. ·
	•	Senior Eng. (\$680/day)*(50 days)=	\$34,000	
		Associate Eng. (\$580/day)*(40 days)=	\$23,200	
٠.		Junior Eng. (\$450/day)*(40 days)=	\$18,000	
		Student (\$264/day)*(20 days)=	\$5,280	•
		Senior Delineator (\$437/day)*(3 days)=	\$1,311	,
		Per Diem (\$125/day)*(5 days)*(3)=	\$1,875	
			Sub Total	\$83,666
	٠	b. Creation of final design after peer review and	d fundina reaui	rements are met.
-		Includes data collection, design, coordination report.	n meetings, and	d final engineering
		Senior Eng. (\$680/day)*(40 days)=	\$27,200	
		Associate Eng. (\$580/day)*(80 days)=	\$46,400	
		Junior Eng. (\$450/day)*(110 days)=	\$49,500	•
		Student (\$264/day)*(110 days)=	\$29,040	
		Senior Delineator (\$437/day)*(25 days)=	\$10,925	
·		Per Diem (\$125/day)*(5 days)*(3)=	\$1,875	•
		Supplies	\$1,394	•
				<u>\$166,334</u>
				\$250,000
		Design and Engineer	ing Total	\$290,000
4.	Cons	truction		Ot to the linear
	4.1.	Division of Engineering to prepare Project Bid S	pecifications (p	er State guidelines),
		advertise, and contract project. This is an estimate	ate based on p	ast projects (D.O.E.
		not contacted)	\$100,000	
		Construction Management (DOE)	\$250,000	0.250 000
		·	Sub Total	\$350,000
	4.2.	Construction management and construction sur		
		Senior Eng. (\$680/day)*(20 days)*(9 mos)= Associate Eng. (\$580/day)*(20 days)*(9 mo	•	
		Junior Eng. (\$450/day)*(20 days)*(9 mos)=	\$81,000	
		Per diem (\$125/day)*(16 days)*(25 mos)=	\$50,000	
		Supplies	\$2,200	
		Сиррисо	Sub Total	\$360,000
			:	·· ···································

```
Material Costs: (Import material by truck over 9 mos. [180 days])
     Round trip (20 miles) - 30 min., load and dump time - 45 min. = 1.25 hrs
      Truck and driver $60.00/hr.
     Unit Weight 1.75 ton/vd
      Fill Material (local gravel company quote) $3.50/ton + tax (%7.75) = $3.77/ton
      Rip Rap $9.00/ton + tax (\%7.75) = $9.70/ton
      8"-12" cobble $10/ton + tax (\%7.75) = $10.78/ton
       Fill Unit Costs:
                                                      = $6.90/ton
        (1.25 hrs * $60/hr.+ $3.77/ton * 24 ton/truck)
                    (24 ton/truck)
                                                      = $12.08/yd3
        (1.75 ton/yd3)*($6.90/ton)
       Rip Rap Unit Costs:
        (1.25 \text{ hrs} * \$60/\text{hr.} + \$9.70/\text{ton} * 24 \text{ ton/truck}) = \$12.83/\text{ton}
                    (24 ton/truck)
                                                       = $22.45/vd3
        (1.75 ton/yd3)*($12.83/ton)
       Cobble Unit Costs:
        (1.25 hrs * $60/hr. + $10.78/ton * 24 ton/truck)= $13.91/ton
                     (24 ton/truck)
                                                       = $24.34/yd3
        (1.75 ton/yd3)*($13.91/ton)
       Total fill needed: 180,000 vd3
       Total rip rap needed: 600 yd3
       Total cobble needed: 10,060 vd3
                   (180,000 yd3)*($12.08/yd3)=
                                                       $2.174.400
       Fill cost:
                        (600 \text{ vd3})^*(\$22.45/\text{yd3})=
                                                       $13,470
       Rip rap cost:
       Cobble cost: (10,060 yd3)*($24.34/yd3)=
                                                       $244.860
                                                       Sub Total......$2,432,730
Equipment costs: (Construction over 9 mos. [180 days])
       2 - D-9 Bulldozers ($16,000/mo)*(9 mos)*(2)=
                                                              $288,000
          Oper ($45/hr)*(8 hrs)*(20 days)*(9 mos)*(2)=
                                                              $129.600
       1 - D-8 Bulldozer ($12,000/mo)*(6 mos)=
                                                              $72,000
                                                              $43,200
          Oper ($45/hr)*(8 hrs)*(20 days)*(6 mos)=
       2 - Water Trucks ($4,000/mo)*(9 mos)(2)=
                                                              $72,000
          Oper ($42/hr)*(8 hrs)*(20 days)*(9 mos)(2)=
                                                              $120,960
       2 - Excavators ($70/hr)*(8 hrs)*(120 days)*(2 exc.)=
                                                              $134,400
                                                              $119,040
          Oper ($62/hr)*(8 hrs)*(20 days)*(6 mos)*(2)=
       6 - 25 yd dumps ($6,500/mo)*(9 mo)*(6 trucks)=
                                                              $351,000
            Oper ($42/hr)*(8 hrs)*(20 days)*(9 mos)*(6)=
                                                              $362,880
                                                              $216,000
       3 - 988 Loaders ($12,000/mo)*(6 mo)*(3 loaders)=
          Oper ($45/hr)*(8 hrs)*(20 days)*(6 mos)*(3)=
                                                              $129,600
       Mob and Demob ($2,000/item)*(16 items)=
                                                              $32,000
                                                       Sub Total......$2,070,680
                                          Total Construction Cost......$5,213,410
```

4.3 Project Construction

5.	Revegetation, Habitat Enhancement and Reporting	
	5.1. Revegetation and Habitat Enhancement:	210.000
	Preliminary design work =	\$10,000
	Final design work =	\$20,000
	Design Implementation =	\$508,000
		Sub Total\$538,000
	5.2. Revegetation and Monitoring, Evaluation and	007.000
	Reporting	\$35,000
		Total\$573,000
6.	Fisheries Monitoring and Evaluation	Total\$276,000
7.	Geomorphic Monitoring, Evaluation, and Adjustments	3
	7.1. Geomorphic Monitoring Evaluation, and Reporting	ng\$150,000
	7.2. Geomorphic Adjustments:	
	Maintenance for duration of 15 year life of berm	project to address areas of proje
	concerns and repairs.	
	Constructed and existing berm maintenance:	•
	Projected cost per foot = \$25	
	Total length of berm to be maintained = 4	
	(\$25/ft)*(4,300 ft)=	\$107,500
	Other concerns to be identified during project	
	monitoring process.	\$100,000
	Gravel additions to the site.	\$300,000
		Sub Total <u>\$507,500</u>
		Total\$657,500
Tc	otal Project Cost without Contingency	\$7,159,910
	ontingency (10% of total project cost)	
C	onungency (10% or total project cost)	
Pr	oject Total Cost	\$7,875,901
	•	
		•

Project Cost Estimate

Robinson/Gallo Project Phase II November, 8 1999

1.	Projec	t Management – DWR	Total	\$50,000
	(estim	nmental Documents. CEQA and permits to be funderate includes Caltrans contribution). n Engineering	ed in cooperation Total	
U .	3.1. F	Preliminary Survey and Engineering Final Design Engineering	•••••	\$40,000
		្នa. Activities required in intermediate steps before t	final design.	
		May include collecting additional data, meeting		atives or
		amendments to design, modification of design,		
			\$34,000	
			\$23,200	
			\$18,000	
			\$5,280	
			\$1,311 \$4,975	
		Per Diem (\$125/day)*(5 days)*(3)=	\$1,875 Sub Total	463 666
			Sub Total	\$65,000
		 b. Creation of final design after peer review and functions data collection, design, coordination management. 		
		Senior Eng. (\$680/day)*(40 days)=	\$27,200	
		Associate Eng. (\$580/day)*(80 days)=	\$46,400	
		Junior Eng. (\$450/day)*(110 days)=	\$49,500	
:		Student (\$264/day)*(110 days)=	\$29,040	•
		Senior Delineator (\$437/day)*(25 days)=	\$10,925	
		Per Diem (\$125/day)*(5 days)*(3)=	\$1,875	1
		Supplies	\$1,394	****
		, , , , , , , , , , , , , , , , , , ,	Sub Total	
			Design Total	
1	Cone	Design and Engineering truction	j Total	.\$290,000
~.	4.1.	Division of Engineering to prepare Project Bid Spec	rifications (ner St	ate quidelines)
		advertise, and contract project. This is an estimate		
		not contacted)	\$100,000	. 0,00.0 (5.0.1.
		Construction Management (DOE)	\$250,000	
		(Sub Total	\$350,000
	4.2.	Construction management and construction survey	1	·
		Senior Eng. (\$680/day)*(20 days)*(9 mos)=	\$122,400	•
		Associate Eng. (\$580/day)*(20 days)*(9 mos)=		
		Junior Eng. (\$450/day)*(20 days)*(9 mos)=	\$81,000	•
		Per diem (\$125/day)*(16 days)*(25 mos)=	\$50,000	
•		Supplies	\$2,200	
			Sub Total	\$360,000

```
4.3 Project Construction
      Material Costs: (Import material by truck over 9 mos. [180 days])
             Round trip (20 miles) - 30 min., load and dump time - 45 min. = 1.25 hrs
            Truck and driver $60.00/hr.
             Unit Weight 1.75 ton/yd
             Fill Material (local gravel company quote) 3.50/ton + tax (\%7.75) = 3.77/ton
             Rip Rap $9.00/ton + tax (\%7.75) = $9.70/ton
             8"-12" cobble 10/ton + tax (\%7.75) = 10.78/ton
              Fill Unit Costs:
               (1.25 \text{ hrs * $60/hr.+ $3.77/ton * 24 ton/truck}) = $6.90/ton
                            (24 ton/truck)
               (1.75 ton/vd3)*($6.90/ton)
                                                              = $12.08/vd3
              Rip Rap Unit Costs:
               (1.25 \text{ hrs} * \$60/\text{hr.} + \$9.70/\text{ton} * 24 \text{ ton/truck}) = \$12.83/\text{ton}
                            (24 ton/truck)
                                                               = $22.45/vd3
               (1.75 ton/yd3)*($12.83/ton)
              Cobble Unit Costs:
               (1.25 hrs * $60/hr. + $10.78/ton * 24 ton/truck)= $13.91/ton
                            (24 ton/truck)
               (1.75 ton/yd3)*($13.91/ton)
                                                               = $24.34/yd3
              Total fill needed: 180,000 vd3
              Total rip rap needed: 600 yd3
              Total cobble needed: 10,060 yd3
                           (180.000 \text{ vd3})*(\$12.08/\text{vd3})=
                                                               $2,174,400
              Fill cost:
                                (600 yd3)*($22.45/yd3)=
                                                               $13.470
              Rip rap cost:
              Cobble cost: (10,060 \text{ yd3})^*(\$24.34/\text{yd3})=
                                                               $244.860
                                                               Sub Total......$2,432,730
       Equipment costs: (Construction over 9 mos. [180 days])
              2 - D-9 Bulidozers ($16,000/mo)*(9 mos)*(2)=
                                                                      $288,000
                  Oper ($45/hr)*(8 hrs)*(20 days)*(9 mos)*(2)=
                                                                      $129,600
                                                                      $72,000
              1 - D-8 Bulldozer ($12,000/mo)*(6 mos)=
                  Oper ($45/hr)*(8 hrs)*(20 days)*(6 mos)=
                                                                      $43,200
              2 - Water Trucks ($4,000/mo)*(9 mos)(2)=
                                                                      $72,000
                  Oper ($42/hr)*(8 hrs)*(20 days)*(9 mos)(2)=
                                                                      $120,960
              2 - Excavators ($70/hr)*(8 hrs)*(120 days)*(2 exc.)=
                                                                      $134,400
                  Oper ($62/hr)*(8 hrs)*(20 days)*(6 mos)*(2)=
                                                                      $119.040
              6 - 25 yd dumps ($6,500/mo)*(9 mo)*(6 trucks)=
                                                                      $351,000
                   Oper ($42/hr)*(8 hrs)*(20 days)*(9 mos)*(6)=
                                                                      $362,880
               3 - 988 Loaders ($12,000/mo)*(6 mo)*(3 loaders)=
                                                                      $216,000
                  Oper ($45/hr)*(8 hrs)*(20 days)*(6 mos)*(3)=
                                                                      $129,600
               Mob and Demob ($2,000/item)*(16 items)=
                                                                      $32,000
                                                               Sub Total......$2,070,680
```

Total Construction Cost......\$5,213,410

 Revegetation, Habitat Enhancement and Reporting Revegetation and Habitat Enhancement: Preliminary design work = Final design work = Design Implementation = 	\$10,000 \$20,000 \$508,000 Sub Total\$538,000
5.2. Revegetation and Monitoring, Evaluation and Reporting	<u>\$35,000</u> Total \$573,000
6. Fisheries Monitoring and Evaluation	Total \$276,000
 Geomorphic Monitoring, Evaluation, and Adjustments Geomorphic Monitoring Evaluation, and Reporting Geomorphic Adjustments: Maintenance for duration of 15 year life of berm proconcerns and repairs. Constructed and existing berm maintenance:	
Total Project Cost without Contingency	\$7,159,910
Contingency (10% of total project cost)	\$715,991
Project Total Cost	\$7,875,901

ATTACHMENT 9

Project Budget

SUBJECT TO REVISION

COST-SHARE BREAKDOWN

ANTICIPATED COST-SHARE FUNDING BREAKDOWN

PROJECT PHASE/TASK	CDWR 4-PUMPS LUMP SUM	CDWR 4-PUMPS ANNUAL	CDFG PROP 70	USFWS CALFED	CALFED PROPOSED	CDWR 4-PUMPS PROPOSED	USFWS CVPIA-AFRP PROPOSED	CDFG TRACY FF PROPOSED	TOTAL \$50,000
1. PROJECT MANAGEMENT - DWR		\$50,000							\$50,000
2. ENVIRONMENTAL DOCUMENTS & PERMITS		\$60,000	\$40,000	-	_				\$100,000
3. DESIGN ENGINEERING 3.1 PRELIMINARY SURVEY AND ENGINEERING 3.2 FINAL DESIGN ENGINEERING	\$40,000	\$40,000	\$210,000						\$40,000 \$250,000 \$290,000
4. CONSTRUCTION 4.1 COST EST, SPECS; BID PROCESS; CONTRACT MGMT 4.2 CONSTRUCTION MANAGEMENT & SURVEY 4.3 CONSTRUCTION		\$250,000 \$360,000 \$461,309		\$100,000 \$2,343,000	\$699,101		\$1,000,000		\$350,000 \$360,000 \$4,503,410 \$5,213,410
5. REVEGETATION/HABITAT ENHANCEMENT 5.1 REVEGETATION/HABITAT ENHANCEMENT 5.2 REVEGETATION MONITORING & EVALUATION		\$288,000 \$35,000					<u>-</u>	\$250,000	\$538,000 \$35,000 \$573,000
6. FISHERIES MONITORING & EVALUATION		\$276,000							\$276,000
7. GEOMORPHIC MONITORING, EVALUATION, & ADJUSTMENTS 7.1 GEOMORPHIC MONITORING & EVALUATION 7.2 GEOMORPHIC ADJUSTMENTS		\$150,000 \$507,500							\$150,000 \$507,500 \$657,500
CONTINGENCY (10% of Project Total) TOTALS	\$40,000	\$ 215,991 \$2,693,800	\$250,000	\$2,443,000	\$699,101	\$500,000 \$500,000	\$1,000,000	\$250,000 \$	\$ 715,991 \$7,875,901

FUNDING SOURCE	AMOUNT	
CDWR 4-Pumps - \$15M Account	\$ 40,000	(Funds expended and work complete
CDWR 4-Pumps - Annual Account (Approved Project)	\$ 2,693,800	
CDFG - Proposition 70 Funds	\$ 250,000	
USFWS - CALFED (Approved Project)	\$ 2,443,000	
CALFED - PSP	\$ 699,101	(PROPOSED)
CDWR 4-Pumps	\$ 500,000	(PROPOSED)
USFWS - CVPIA/AFRP	\$ 1,000,000	(PROPOSED)
CDFG - Tracy Fish Mitigation Agreement Funds	\$ 250,000	(PROPOSED)
	\$ 7.875.901	•

MERCED RIVER CHINOOK SALMON RESTORATION ACTION

ROBINSON RANCH FICAL YEAR COST-SHARE BREAKDOWN

2-6-1 CONSTRUCTION PLAN

SUBJECT TO REVISION

ANTICIPATED FY BREAKDOWN (Average Conditions) STATE FISCAL YEAR

•								
FUNDING SOURCE	Prior FY'S	FY 1998-99	FY 99-2000	FY 2000-01	FY 2001-02	FY 2002-03	FY 2003-04+	TOTAL
4-PUMPS (CDWR) 4-Pumps - \$15M Account (Approved) 4-Pumps - Annual Account (Approved) 4-Pumps (Proposed)	\$40,000	\$111,216	\$106,367	\$309,444	\$764,183	\$355,828 \$500,000	\$1,046,762	\$40,000 \$2,693,800 \$500,000 \$3,233,800
CDFG Proposition 70 Funds (Apmoved) Tracy Fish Mitigation Agreement Funds (Proposed)		\$50,000	\$200,000		\$102,500	\$105,000	\$42,500	\$250,000 \$250,000 \$500,000
CALFED (USFWS) USFWS - CALFED (Approved) CALFED - PSP (Proposed)				\$1,100,000	\$1,343,000 \$699,101			\$2,443,000 \$699,101 \$3,142,101
CVPIA-AFRP (USFWS) USFWS - CVPIA/AFRP (Proposed)					\$1,000,000			\$1,000,000
Construction Time (Months)	\$40,000	\$161.216	\$306.367	(2 mo) \$1,409,444	(6 mo) \$3,908,784	(1 mo) \$960,828	\$1,089,262	\$7,875,901 \$7,875,901

2-5-1 CONSTRUCTION PLAN

MERCED RIVER CHINOOK SALMON RESTORATION ACTION ROBINSON RANCH BUDGET

SUBJECT TO REVISION

ANTICIPATED FY BREAKDOWN (Average Conditions) STATE FISCAL YEAR

	Prior FY'S	FY 1998-99	FY 99-2000	FY 2000-01	FY 2001-02	FY 2002-03	FY 2003-04+	TOTAL
PROJECT PHASE/TASK PROJECT MANAGEMENT - DWR	THOI FT S	\$5,279	\$20,000	\$8,000	\$8,000	\$5,000	\$3,721	\$50,000
2. ENVIRONMENTAL DOCUMENTS & PERMITS	 	\$10,329	\$65,000	\$12,000	\$9,000	\$3,671		\$100,000
DESIGN ENGINEERING 1 PRELIMINARY SURVEY AND ENGINEERING 3.2 FINAL DESIGN ENGINEERING	\$40,000	\$145,608	\$104,392					\$40,000 \$250,000 \$290,000
4. CONSTRUCTION 4.1 COST EST, SPECS: BID PROCESS, CONTRACT MGMT 4.2 CONSTRUCTION MANAGEMENT & SURVEY 4.3 CONSTRUCTION				\$155,555 \$80,000 \$1,000,758 (2 mo)	\$166,667 \$240,000 \$3,002,273 (6 mo)	\$27,778 \$40,000 \$500,379 (1 mo)		\$350,000 \$360,000 \$4,503,410 \$5,213,410
REVEGETATION HABITAT ENHANCEMENT S.1 REVEGETATIONHABITAT ENHANCEMENT S.2 REVEGETATION MONITORING & EVALUATION					\$100,000 \$2,500	\$100,000 \$5,000	\$338,000 \$27,500	\$538,000 \$35,000 \$573,000
8. FISHERIES MONITORING & EVALUATION	-					\$154,000	\$122,000	\$276,000
7. GEOMORPHIC MONITORING, EVALUATION, & ADJUSTMENTS 7.1 GEOMORPHIC MONITORING & EVALUATION 7.2 GEOMORPHIC ADJUSTMENTS				\$25,000	\$25,000	\$25,000	\$75,000 \$507,500	\$150,000 \$507,500 \$657,500
CONTINGENCY (10% of Total Project)	\$40,000	\$161,216	\$116,975 \$306,367		\$355,344 \$3,908,784	\$100,000 \$960,828		\$715,991 \$7,875,901

\$7,875,901

MERCED RIVER CHINOOK SALMON RESTORATION ACTION ROBINSON RANCH EXPENDITURES (THRU APR-21-2000)

SUBJECT TO REVISION

UPDATED APR-21-2000

FISCAL YEAR BREAKDOWN

STATE FISCAL YEAR

PROJECT PHASE/TASK	Prior FY'S	FY 1998-99	FY 89-2000	FY 2000-01	FY 2001-02	FY 2002-03	FY 2003-04+	TOTAL	BUDGETED	DIFFERENCE
1. PROJECT MANAGEMENT - DWR		\$5,279	\$15,949					\$21,228	\$50,000	\$28,772
2. ENVIRONMENTAL DOCUMENTS & PERMITS		\$5,570	\$50,955					\$56,525	\$100,000	\$43,475
DESIGN ENGINEERING 3.1 PRELIMINARY SURVEY AND ENGINEERING 3.2 PINAL DESIGN ENGINEERING	\$40,000	\$100,367	\$171,367					\$40,000 \$271,734 \$311,734	\$40,000 \$250,000 \$290,000	\$0 (\$21,734) (\$21,734)
4. CONSTRUCTION 4.1 COST EST, SPECS, BID PROCESS, CONTRACT MGMT 4.2 CONSTRUCTION MANAGEMENT & SURVEY 4.3 CONSTRUCTION (* 10% CONTINGENCY)								\$0 \$0 \$0 \$0	\$350,000 \$360,000 \$4,503,410 \$5,213,410	\$360,000 \$4,503,410
5. REVEGETATION: HABITAT ENHANCEMENT 5.1 REVEGETATION:HABITAT ENHANCEMENT 5.2 REVEGETATION MONITORING & EVALUATION								\$0 \$0 \$0	\$538,000 \$35,000 \$573,000	\$35,000
S. FISHERIES MONITORING & EVALUATION	***							\$0	\$276,000	\$276,000
7. CEOMORPHIC MONITORING, EVALUATION, & ADJUSTMENTS 7.1 GEOMORPHIC MONITORING & EVALUATION 7.2 GEOMORPHIC ADJUSTMENTS								\$0 \$0 \$0	\$150,000 \$507,500 \$657,500	\$507,500 \$657,500
CONTINGENCY (10% of Total Project) TOTALS	\$40,000	\$111,216	\$238,271	\$0	\$0	s	\$0	\$0 \$389,487	\$ 715,991 \$7,875,901	

\$389,487

MERCED RIVER CHINOOK SALMON RESTORATION ACTION

ROBINSON RANCH

BUDGET

USFWS - CALFED Funding

SUBJECT TO REVISION

STATE F	ISCAL YEAR	
V 2000 04	EV 2004 02	

PROJECT PHASE/TASK	FY 1998-99	FY 99-2000	FY 2000-01	FY 2001-02	FY 2002-03	TOTAL
1. PROJECT MANAGEMENT - DWR						
2. ENVIRONMENTAL DOCUMENTS & PERMITS						
3. DESIGN ENGINEERING 3.1 PRELIMINARY SURVEY AND ENGINEERING 3.2 FINAL DESIGN ENGINEERING						
4. CONSTRUCTION 4.1 COST EST, SPECS; BID PROCESS; CONTRACT MGMT 4.2 CONSTRUCTION MANAGEMENT & SURVEY 4.3 CONSTRUCTION			\$100,000 \$1,000,000	Proposed for Ta \$699,101 \$1,343,000		\$100,000 \$2,343,000 \$2,443,000
5. REVEGETATION/ HABITAT ENHANCEMENT 5.1 REVEGETATION/HABITAT ENHANCEMENT 5.2 REVEGETATION MONITORING & EVALUATION						
6. FISHERIES MONITORING & EVALUATION			_			
7. GEOMORPHIC MONITORING, EVALUATION, & ADJUSTMENTS 7.1 GEOMORPHIC MONITORING & EVALUATION 7.2 GEOMORPHIC ADJUSTMENTS						· ·
CONTINGENCY (10% of Total Project) TOTALS		\$0	\$1,100,000	\$1,343,000		\$2,443,000
				\$699,101		•

\$2,042,101

FUNDING SOURCE USFWS - CALFED CALFED - PSP AMOUNT \$2,443,000 \$699,101 (PROPOSED) \$3,142,101

Task Direct Labor Salary Benefits Trave Expendables Contracts Here) Equipment Remissic Construction \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	Table 1. Annual and total project budget for the Merced River Salmon Habitat Enhancement, River Miles 42 to 43.5	budget for the	Aerced River	Salmon Habit	tat Enhancem	ent, River Mile	s 42 to 43.5				
Direct Labor Salary Benefits Travel Expendables Service Sinow % Equipment Remission Solucent Facility Solucent S					Subject to	Overhead			Exempt from	n Overhead	
Construction		Direct Labor	ico O	Donoffie	Travel	Supplies & Expendables	Service	Overhead (show % here)	Equipment	Graduate Student Fee Remission	Total Cost
\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$							\$699,101				\$699,101
80 \$0 \$0 \$0 \$0 \$0 \$0			0\$				\$699,101	0\$		\$0	\$699,101
	Cost		\$				\$699,101	\$0		\$0	\$699,101
				-							
									i !	:	
	-										
						:					
					i		: 				

MERCED RIVER CHINOOK SALMON RESTORATION ACTION

ROBINSON RANCH

BUDGET

USFWS - CVPIA Andromous Fish Restoration Program Funding

SUBJECT TO REVISION

			STATE F	SCAL YEAR	`	
PROJECT PHASE/TASK	FY 1998-99	FY 99-2000	FY 2000-01	FY 2001-02	FY 2002-03	TOTAL
1. PROJECT MANAGEMENT - DWR						
2. ENVIRONMENTAL DOCUMENTS & PERMITS		1				
DESIGN ENGINEERING THE SURVEY AND ENGINEERING THE SURVEY AND ENGINEERING THE SURVEY AND ENGINEERING						
4. CONSTRUCTION 4.1 COST EST, SPECS; BID PROCESS; CONTRACT MGMT 4.2 CONSTRUCTION MANAGEMENT & SURVEY 4.3 CONSTRUCTION			·	\$1,000,000		\$1,000,000 \$1,000,000
REVEGETATION/ HABITAT ENHANCEMENT REVEGETATION/HABITAT ENHANCEMENT REVEGETATION MONITORING & EVALUATION						
6. FISHERIES MONITORING & EVALUATION						
7. GEOMORPHIC MONITORING, EVALUATION, & ADJUSTMENTS 7.1 GEOMORPHIC MONITORING & EVALUATION 7.2 GEOMORPHIC ADJUSTMENTS						
CONTINGENCY (10% of Total Project) TOTALS				\$1,000,000		\$1,000,000

FUNDING SOURCE
USFWS - CVPIA/AFRP (not yet secured)

<u>AMOUNT</u> \$1,000,000

SUBJECT TO REVISION

MERCED RIVER CHINOOK SALMON RESTORATION ACTION ROBINSON RANCH CDWR - 4-Pumps Funding BUDGET

STATE FISCAL YEAR

	i		100000000000000000000000000000000000000	EV 2000 04	EV 2001-02	FY 2002-03	FY 2003-04+	TOTAL
PROJECT PHASE/TASK 1. PROJECT MANAGEMENT - DWR	Prior FY'S	\$5,279	\$20,000	\$8,000	\$8,000	\$5,000	\$3,721	\$50,000
2. ENVIRONMENTAL DOCUMENTS & PERMITS		\$5,570	\$29,570	\$12,000	000'6\$	\$3,671		\$59,811
3. DESIGN ENGINEERING 3.1 PRELIMINARY SURVEY AND ENGINEERING 3.2 FINAL DESIGN ENGINEERING	\$40,000	\$100,367						\$40,000 \$0 \$40,000
4. CONSTRUCTION 4.1 COST EST, SPECS; BID PROCESS; CONTRACT MGMT 4.2 CONSTRUCTION MANAGEMENT & SURVEY 4.3 CONSTRUCTION				\$55,555 \$80,000 \$758	\$166,667 \$240,000 \$315,516	\$27,778 \$40,000 \$500,379		\$250,000 \$360,000 \$816,653 \$1,426,653
5. REVEGETATION/ HABITAT ENHANCEMENT 5.1 REVEGETATION/HABITAT ENHANCEMENT 5.2 REVEGETATION MONITORING & EVALUATION							\$295,500	\$295,500 \$27,500 \$323,000
6. FISHERIES MONITORING & EVALUATION						\$154,000	\$122,000	\$122,000
7. GEOMORPHIC MONITORING, EVALUATION, & ADJUSTMENTS 7.1 GEOMORPHIC MONITORING & EVALUATION 7.2 GEOMORPHIC ADJUSTMENTS				\$25,000	\$25,000	\$25,000	\$75,000 \$507,500	\$150,000 \$507,500 \$657,500
CONTINGENCY (10% of Total Project)	\$40,000	\$111,216	\$56,797 \$106,367	\$128,131	\$764,183	\$100,000 \$855,828	\$15,541 \$1,046,762	\$300,469 \$3,233,800

FUNDING SQURCE CDWR - Four Pumps \$15M Funds CDWR - Four Pumps Annual Funds (Approved Project) CDWR - Four Pumps

\$40,000 (Funds expended and work completed) \$2,693,800 \$500,000 (PROPOSED) \$3,233,800 AMOUNT

MERCED RIVER CHINOOK SALMON RESTORATION ACTION

ROBINSON RANCH BUDGET

CDFG - Prop 70 Funding

SUBJECT TO REVISION

STATE FISCAL YEAR

PROJECT PHASE/TASK	FY 1998-99	FY 99-2000	FY 2000-01	FY 2001-02	FY 2002-03	TOTAL
1. PROJECT MANAGEMENT - DWR			1			
2. ENVIRONMENTAL DOCUMENTS & PERMITS	\$4,759	\$35,430				\$40,189
DESIGN ENGINEERING THE RELIMINARY SURVEY AND ENGINEERING THE RELIMINARY SURVEY AND ENGINEERING	\$45,241	\$164,570				\$209,811
4. CONSTRUCTION 4.1 COST EST, SPECS; BID PROCESS; CONTRACT MGMT 4.2 CONSTRUCTION MANAGEMENT & SURVEY 4.3 CONSTRUCTION						
REVEGETATION/ HABITAT ENHANCEMENT THE STATE OF T						
6. FISHERIES MONITORING & EVALUATION						
7. GEOMORPHIC MONITORING, EVALUATION, & ADJUSTMENTS 7.1 GEOMORPHIC MONITORING & EVALUATION 7.2 GEOMORPHIC ADJUSTMENTS						
CONTINGENCY (10% of Total Project) TOTALS	\$50,000	\$200,000				\$250,000

FUNDING SOURCE CDFG Prop-70 AMOUNT \$250,000

MERCED RIVER CHINOOK SALMON RESTORATION ACTION

ROBINSON RANCH

BUDGET

CDFG Tracy Mitigation Agreement Funding

SUBJECT TO REVISION

			ST	ATE FISCAL	ÆAR		
PROJECT PHASE/TASK	FY 1998-99	FY 99-2000	FY 2000-01	FY 2001-02	FY 2002-03	FY 2003-04+	TOTAL
1. PROJECT MANAGEMENT - DWR							
2. ENVIRONMENTAL DOCUMENTS & PERMITS							
3. DESIGN ENGINEERING 3.1 PRELIMINARY SURVEY AND ENGINEERING 3.2 FINAL DESIGN ENGINEERING							
4. CONSTRUCTION 4.1 COST EST, SPECS; BID PROCESS; CONTRACT MGMT 4.2 CONSTRUCTION MANAGEMENT & SURVEY 4.3 CONSTRUCTION							
REVEGETATION: HABITAT ENHANCEMENT REVEGETATION:HABITAT ENHANCEMENT REVEGETATION MONITORING & EVALUATION				\$102,500	\$105,000	\$42,500	\$250,000 -
6. FISHERIES MONITORING & EVALUATION							
7. GEOMORPHIC MONITORINS, EVALUATION, & ADJUSTMENTS 7.1 GEOMORPHIC MONITORING & EVALUATION 7.2 GEOMORPHIC ADJUSTMENTS							
CONTINGENCY (10% of Total Project)		1		\$102,500	\$105,000	\$42,500	\$250,000

FUNDING SOURCE CDFG - Tracy (not yet secured)

TOTALS

AMOUNT \$250,000

ATTACHMENT 10

Threshold Documents

Letters of Notification
Merced Co. Planning Department
Merced Irrigation District

Environmental Compliance Check Sheet

Land Use Check Sheet

Application for Federal Assistance Standard Form 424



DEPARTMENT OF FISH AND GAME

http://www.dfg.ca.gov 1416 Ninth Street Sacramento, CA 95814



(916) 657-4226

May 9, 2000

Des Johnston Environmental Planner Merced County Planning Department 222 M Street Merced, CA 95340

Dear Mr. Johnston:

I am writing to notify the County of Merced that the California Department of Fish and Game in cooperation with the California Department of Water Resources has submitted a grant application for CALFED Ecosystem Restoration funding to conduct a Chinook Salmon Habitat Enhancement Project on the Merced River. A requirement of the grant application is that the applicant provide notification to the local County Board of Supervisors and Planning Department of their intent to submit an application. Included for your review is a copy of the grant application. If you have any questions, please contact me at the letter head address or by telephone at (916) 657-4226.

Sincerely,

Fred Jurick

Associate Fishery Biologist

Central Valley / Bay Delta Branch



DEPARTMENT OF FISH AND GAME

http://www.dfg.ca.gov 1416 Ninth Street Sacramento, CA 95814

(916) 657-4226



May 9, 2000

Ted Selb Assistant General Manager, WR Merced Irrigation District P.O. Box 2288 Merced, CA 95344-0288

Dear Mr. Selb:

I am writing to notify the County of Merced that the California Department of Fish and Game in cooperation with the California Department of Water Resources has submitted a grant application for CALFED Ecosystem Restoration funding to conduct a Chinook Salmon Habitat Enhancement Project on the Merced River. A requirement of the grant application is that the applicant provide notification to the local County Board of Supervisors and Planning Department of their intent to submit an application. Included for your review is a copy of the grant application. If you have any questions, please contact me at the letter head address or by telephone at (916) 657-4226.

Sincerely,

Fred Jurick

Associate Fishery Biologist Central Valley / Bay Delta Branch

4.5 Environmental Compliance Checklist

All applicants must fill out this Environmental Compliance Checklist. Applications must contain answers to the following questions to be responsive and to be considered for funding. <u>Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.</u>

1.	Do any of the actions included in the proposal require compliance with either the California Enviro	nmental
	Quality Act (CEQA), the National Environmental Policy Act (NEPA), or both?	
	•	
	·	

NO

2. If you answered yes to #1, identify the lead governmental agency for CEQA/NEPA compliance.

California Department of Fish and Game Lead Agency

 If you answered no to # 1, explain why CEQA/NEPA compliance is not required for the actions in the proposal.
 Not Applicable

4. If CEQA/NEPA compliance is required, describe how the project will comply with either or both of these laws. Describe where the project is in the compliance process and the expected date of completion.

Currently project staff are completing environmental survey within the Robinson project site. A CEQA Negative Declaration will be prepared by CDFG/CDWR staff and will be submitted for environmental review by October 2000. Permits are anticipated by March 2001.

A NEPA Phased Programmatic Document for the entire four mile Merced River Salmon Habitat Enhancement Project Site is also being prepared by USFWS staff. Pubic hearings are anticipated by December 2000. Once the public hearings are completed, a NEPA Environmental Assessment for the project site will be prepared as supplement to the Phased NEPA Programmatic Document.

5. Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?

If yes, the applicant must attach written permission for access from the relevant property owner(s). Research and monitoring field projects for which specific field locations have not been identified will be required to provide access needs and permission for access with 30 days of notification of approval.

Letter of approval attached to project proposal

LOCAL		
Conditional use permit		
Variance		1
Subdivision Map Act approval		
Grading permit		
General plan amendment		
Specific plan approval		
Rezone		
Williamson Act Contract		
cancellation		
Other		
(please specify)		
None required		
. -		
STATE		
CESA Compliance	<u>×</u>	(CDFG)
Streambed alteration permit	<u>X</u>	(CDFG)
CWA § 401 certification	_ <u>X</u> _	(RWQCB)
Coastal development permit	$\frac{\frac{X}{X}}{\frac{X}{X}}$	(Coastal Commission/BCDC)
Reclamation Board approval	_ <u>X</u> _	
Notification		(DPC, BCDC)
Other		
(please specify)		
None required		•
THE PART AT		•
FEDERAL ESA Consultation	*r	(HEPWC)
	<u>X</u>	(USFWS)
Rivers & Harbors Act permit	~	(ACOE)
CWA § 404 permit Other	<u>X</u>	(ACOE)

DPC = Delta Protection Commission CWA = Clean Water Act CESA = California Endangered Species Act USFWS = U.S. Fish and Wildlife Service ACOE = U.S. Army Corps of Engineers

ESA = Endangered Species Act
CDFG = California Department of Fish and Game
RWQCB = Regional Water Quality Control Board
BCDC= Bay Conservation and Development Comm.

4.6 Land Use Checklist

All applicants must fill out this Land Use Checklist for their proposal. Applications must contain answers to the following questions to be responsive and to be considered for funding. <u>Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.</u>

	X			
	YES	•	NO	
2. Not	If NO to # 1, explain what Applicable	at type of actions are involv	ed in the proposal (i.e., research onl	y, planning only).
3. Stre	If YES to # 1, what is the eam reconfiguration, reduced		or restriction under the proposal? duced farming operations.	
4.	If YES to # 1, is the land	currently under a William	on Act contract?	
			<u>X</u>	
	YES		X NO	
5.	If YES to # 1, answer the	e following:		
	Current land use		•	
	Current zoning			
	Current general plan de	signation		
6.	' If VES to #1 is the land	classified as Prime Farmla	nd, Farmland of Statewide Importa	nce or Unique
••		tment of Conservation Imp		·
		· v	•	
	YES	$\frac{X}{NO}$	DON'T KNOW	
	125	110	DOIL LAUTOW	
7.	If YES to # 1, how many	y acres of land will be subje	et to a land use change under the pr	oposal?
8.	If YES to # 1, is the pro	perty currently being farm	d or grazed?	
	x			
	YES		NO	
9.	If YES to #8, what are	the number of employees.	acra	
٠.	11 1 E5 to #6, what are	the total number of employees		
		the total number of emps	<u> </u>	
10.	Will the applicant acqu	ire any interest in land und	er the proposal (fee title or a conser	vation easement)?
	<u>X</u>		· 	
	YES		NO	

11.	What entity/organization will hold the interest? <u>Califor</u>	nia Department of Fish and Game (CDFG)
12.	If YES to # 10, answer the following:	
	Total number of acres to be acquired under proposal	currently under discussion
	Number of acres to be acquired in fee	currently under discussion
	Number of acres to be subject to conservation easement	currently under discussion
13.	For all proposals involving physical changes to the land organization will:	or restriction in land use, describe what entity
	manage the property	CDFG
	provide operations and maintenance services	California Department of WaterResources (
	conduct monitoring	CDFG and CDWR
14.	For land acquisitions (fee title or easements), will existin	g water rights also be acquired?
		<u>X</u>
	YES	NO
15.	Does the applicant propose any modifications in the use	or delivery of the water rights?
		<u>X</u>
	YES	NO
16.	If YES to # 15, describe	

Agreement No.:_	
Exhibit:_	·

STANDARD CLAUSES INTERAGENCY AGREEMENTS

Audit Clause. For Agreements in excess of \$10,000, the parties shall be subject to the examination and audit of the State Auditor for a period of three years after final payment under the Agreement. (Government Code Section 8546.7).

Availability of Funds. Work to be performed under this Agreement is subject to availability of funds through the State's normal budget process.

Interagency Payment Clause. For services provided under this Agreement, charges will be computed in accordance with State Administrative Manual Sections 8752 and 8752.1.

Termination Clause. Either State agency may terminate this Agreement upon thirty (30) days' advance written notice. The State agency providing the services shall be reimbursed for all reasonable expenses incurred up to the date of termination.

Severability. If any provision of this Agreement is held invalid or unenforceable by any court of final jurisdiction, it is the intent of the parties that all other provisions of this Agreement be construed to remain fully valid, enforceable, and binding on the parties.

Y2K Language. The Contractor warrants and represents that the goods or services sold, leased, or licensed to the State of California, its agencies, or its political subdivisions, pursuant to this Agreement are "Year 2000 compliant" For purposes of this Agreement, a good or service is Year 2000 compliant if it will continue to fully function before, at, and after the Year 2000 without interruption and, if applicable, with full ability to accurately and unambiguously process, display, compare, calculate, manipulate, and otherwise utilize date information. This warranty and representation supersedes all warranty disclaimers and limitations and all limitations on liability provided by or through the Contractor.

APPLICATION FOR				OMB Approval No. 0348-0043	
FEDERAL ASSISTAN	ICE	2. DATE SUBMITTED		Applicant Identifier	
1. TYPE OF SUBMISSION:	Preapplication	3. DATE RECEIVED BY	STATE	State Application Identifier	
Application Construction Non-Construction	Construction Non-Construction	4. DATE RECEIVED BY	FEDERAL AGENCY	Federal Identifier	
5. APPLICANT INFORMATION			Organizational Unit:		
Legal Name: California Department of Fish and Game - Lead Agency California Department of Water Resources - Financial Agent			CDFG: Central Valle	y Bay-Delta Br.; CDWR: Environmental Services	
Address (give city, county, State, and zip code): CDWR: 3251 S. St. CDFG: 4001 N. Wilson Way Sacramento, CA 95816 Sacramento County San Joaquin County				number of person to be contacted on matters involving	
			this application (give area code) CDFG: Fred Jurick (916) 657-4226 CDWR: Stephani Spaar (916) 227-7536		
6. EMPLOYER IDENTIFICATION NUMBER (E/N): CDFG: 94-1697567 CDWR: 52-1692634			7. TYPE OF APPLICANT: (enter appropriate letter in box)		
			A. State	H. Independent School Dist.	
8. TYPE OF APPLICATION:		-	B. County	I. State Controlled Institution of Higher Learning	
☑ New	Continuation	Revision	C. Municipal	J. Private University	
	· · · · · · · · · · · · · · · · · · ·	_	D. Township	K. Indian Tribe	
If Revision, enter appropriate letter(s) in box(es)		E. Interstate	L Individual		
			F. Intermunicipal	M. Profit Organization	
, n more and t man = 1 = 1 = 1		e Duration	G. Special District	N. Other (Specify)	
D. Decrease Duration Other(specify):		9. NAME OF FEDER	AL AGENCY:		
			CALFED/CVPIA/US	SFWS .	
10. CATALOG OF FEDERAL D	OMESTIC ASSISTANCE N	IUMBER:	11. DESCRIPTIVE T	ITLE OF APPLICANT'S PROJECT:	
10. 04(4200 0) 1200			Phase 3 - Merc	ed River Salmon Habitat Enhancement:	
				River Miles 42.0 and 43.5 (Robinson and Permit #307	
TITLE:			sites)		
12. AREAS AFFECTED BY PRO	OJECT (Cities, Counties, S	tates, etc.):			
Merced County	•				
13. PROPOSED PROJECT	14. CONGRESSIONAL D	ISTRICTS OF:			
Start Date	a. Applicant CDWR - Sacto: Congre	ss District 5	b. Project		
15. ESTIMATED FUNDING:			16. IS APPLICATION ORDER 12372 F	N SUBJECT TO REVIEW BY STATE EXECUTIVE PROCESS?	
a. Federal	\$ 2,443,000	.00	A VEC. THE POS	EAPPLICATION/APPLICATION WAS MADE	
CALFED		00		LE TO THE STATE EXECUTIVE ORDER 12372	
CDWR - Four Pumps 3,233,800		PROCESS FOR REVIEW ON:			
c. Applicant (State) CDFG - Tracy & Prop 70	\$ 500,000		DATE	·	
d. Local	\$.00		RAM IS NOT COVERED BY E. O. 12372	
e. Federal \$ 1,000,000		OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW			
f. Other CALFED Prop 204	\$ 699,101	,00	17. IS THE APPLIC	ANT DELINQUENT ON ANY FEDERAL DEBT?	
g. TOTAL	\$ 7,875,901	00		,* attach an explanation.	
18. TO THE BEST OF MY KNO	OWLEDGE AND BELIEF, A	ALL DATA IN THIS APPI GOVERNING BODY OF	LICATION/PREAPPLIC THE APPLICANT AND	ATION ARE TRUE AND CORRECT, THE THE APPLICANT WILL COMPLY WITH THE	
ATTACHED ASSURANCES II					
a. Type Name of Authorized Re Randall L. Brown		b. Title Chief, Environment	al Services Office	c. Telephone Number (916) 227-7531	
d. Signature of Authorized Rep	resentative			e. Date Signed 5/8/00	

Į				OMB Approval No. 0348-004	8
	BUDGET INFORMATION - Construction Programs - Construction Programs - Construction Programs - Construction of the Federal share of project costs eligible for participation. If such is the case, you will be notified.	INFORMATION - Construction Programs	ction Programs	e case, you will be notified.	i
×	OTE: Certain Federal assistance programs require additional computation	a. Total Cost	b. Costs Not Allowable for Participation	c. Total Allowable Costs (Columns a-b)	Ţ
	Administrative and legal expenses	00.	00.	\$	
Ni	Land, structures, rights-of-way, appraisals, etc.	\$	\$	\$	
က	Relocation expenses and payments	9.00	8	00° s	
4.	Architectural and engineering fees	\$ 250,000	\$	00.	
ທ່	Other architectural and engineering fees	\$ 40,000	\$	00.	
ဖ	Project inspection fees	\$ 710,000	\$	oo.	<u>.</u>
<u> </u>	Site work	\$ 1,045,500	\$	00.	
ω.	Demolition and removal	900.	\$	00.	
ග්	Construction	\$ 4,503,410	\$	\$ 1,000,000	<u>.</u>
<u> </u>	Equipment	8	\$	\$	•
=	Miscellaneous - Permits and Monitoring	\$ 561.000	\$	90°.	٥
<u> </u>	SUBTOTAL (sum of lines 1-11)		00. \$	\$ \$	٥
<u>+</u>	Contingencies	\$ 715,991	00.	\$	۰
4	SUBTOTAL	\$ 7,875,901	\$	о. •	8
5.	Project (program) income	\$	\$	6.	8.
6	TOTAL PROJECT COSTS (subtract #15 from #14)	\$ 7,875,901	000	\$ 1,000,000	00
<u> </u>		FEDERAL FUNDING			
17.	Federal assistance requested, calculate as follows: (Consult Federal agency for Federal percentage share.) Enter the resulting Federal share.	Enter eligible costs from line 16c Multiply X	16c Multiply X%	\$ 1,000,000	8.

Standard Form 424C (Rev. 7-97) Prescribed by OMB Circular A-102

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ASSURANCES - CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0042), Washington, DC 20503.

PLEASE <u>DO NOT</u> RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the Awarding Agency. Further, certain Federal assistance awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

- Has the legal authority to apply for Federal assistance, and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of the project described in this application.
- Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
- 3. Will not dispose of, modify the use of, or change the terms of the real property title, or other interest in the site and facilities without permission and instructions from the awarding agency. Will record the Federal interest in the title of real property in accordance with awarding agency directives and will include a covenant in the title of real property aquired in whole or in part with Federal assistance funds to assure non-discrimination during the useful life of the project.
- Will comply with the requirements of the assistance awarding agency with regard to the drafting, review and approval of construction plans and specifications.
- 5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progress reports and such other information as may be required by the assistance awarding agency or State.
- Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
- Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.

- 8. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
- Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
- 10. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681 1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (i) the requirements of any other nondiscrimination statute(s) which may apply to the application.

- 11. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal and federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
- 12. Will comply with the provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.
- 13. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333) regarding labor standards for federally-assisted construction subagreements.
- 14. Will comply with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
- Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the

- National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
- 16. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
- 17. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).
- 18. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
- 19. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	TITLE	
Al Brown	Chief Environmental Services Office	
APPLICANT ORGANIZATION	DATE SUBMITTED	
California Department of Water Resources	5/8/60	